BURSAR'S OFFICE

UNIVERSITY OF SANTA CLARA

Catalogue for the Ninety-Fifth Year
1945-1946

ANNOUNCEMENTS 1946-1947

University of Santa Clara

•

COLLEGE OF ARTS AND SCIENCES

This College offers major courses in the Departments of Economics, English, History, Philosophy, Political Science, Biology and Chemistry leading to the Bachelor's degree.
Courses in the College of Arts and Sciences are approved by the American Medical Association for entrance to medical school.

COLLEGE OF BUSINESS ADMINISTRATION

A four-year course leading to the degree of Bachelor of Commercial Science.

COLLEGE OF ENGINEERING

Four- and five-year courses in Civil, Electrical and Mechanical Engineering.
Accredited by the Engineering Council for Professional Development.

COLLEGE OF LAW

A three-year full time day law course leading to the degree of Bachelor of Laws, following three years' pre-legal work in the College of Arts and Sciences.
Approved by the American Bar Association.
Member Association of American Law Schools

For Catalogue of the University

Address

The Registrar

University of Santa Clara, Santa Clara, California

University of Santa Clara

CATALOGUE

FOR THE NINETY-FIFTH YEAR

1945-1946

●

ANNOUNCEMENTS 1946-1947

●

To mould men after the model of the Man-God, and thus form them to serve their fellowmen, their country and their God; this is the ideal and the purpose of the University of Santa Clara.

Member National Catholic Educational Association
Member Jesuit Educational Association
Member Northwest Association of Secondary and Higher Schools
Member American Council on Education
Accredited by Engineering Council for Professional Development
Approved by the American Bar Association
Member Association of American Law Schools
Approved by the American Medical Association
Member Association of American Colleges

PUBLISHED BY THE UNIVERSITY OF SANTA CLARA
SANTA CLARA, CALIFORNIA

MAY 1946

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The Corporate Title of the University is

PRESIDENT AND BOARD OF TRUSTEES OF SANTA CLARA COLLEGE

BOARD OF TRUSTEES

†WILLIAM CHARLES GIANERA
‡CHARLES JOHN WALSH
President
ERNEST PAUL WATSON
Secretary and Treasurer
EUGENE MICHAEL BACIGALUPI
JAMES A. BACIGALUPI
GEORGE H. CASEY
CONSTANTINE M. CASTRUCCIO
*CLARENCE C. COOLIDGE
JOSEPH RANDALL CROWLEY
AUSTIN JOSEPH FAGOTHEY
WILLIAM CHARLES GIANERA
JOHN PATRICK O'CONNELL
JAMES HENRY STREHL

EXECUTIVE BOARD

THE PRESIDENT THE SECRETARY
*CLARENCE C. COOLIDGE

---

*CLARENCE C. COOLIDGE

CONSULTING ATTORNEY

† Assumed Office October 30, 1945.
‡ Resigned October 30, 1945.
* Deceased January 11, 1946.

CALENDAR

1946

September

S	M	T	W	Th	F	S
						7
1	2	3	4	5	6	14
8	9	10	11	12	13	21
15	16	17	18	19	20	28
22	23	24	25	26	27	
29	30					

Sept. 2: Registration for Fall Semester College of Law; 10-12: Registration for Fall Semester, all other departments; 13: Instructions begins 14; Examinations to Remove Conditions; 18-20: Students' Retreat; 21: Mass of the Holy Ghost.

October

		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Oct. 21-26: Mid-Term Examinations; 30: Last day to submit subjects for Senior Theses.

November

					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Nov. 1: All Saints Day, a holiday; 7: Mass for deceased Faculty and Alumni; 28-30: Thanksgiving Holidays.

December

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Dec. 2-7: Mid-Term Examinations; 21-Jan. 5: Christmas Recess.

1947

January

			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Jan. 8: Registration for Spring Semester, College of Law; 27-31: Final Examinations all other departments.

CALENDAR

1947

February

S	M	T	W	Th	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	

Feb. 7-8: Registration for Spring Semester; 10: Classes resumed; 15: Examination to remove Conditions; 22: Washington's Birthday, a holiday.

March

						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Mar. 24-29: Mid-Term Examinations.

April

		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

April 3-7: Easter Recess; 19: Senior Theses due; 29: President's Day, a holiday.

May

				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

May 5-10: Mid-Term Examinations; 6: Registration for Summer Semester (open only to veterans), College of Law.

June

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

June 12-17: Final Examinations; 21: Commencement.

OFFICERS OF ADMINISTRATION AND INSTRUCTION

---

†WILLIAM CHARLES GIANERA, S. J.
President

‡CHARLES JOHN WALSH, S. J.
President

JOHN PATRICK O'CONNELL, S. J.
Vice-President, Director of Discipline

JAMES A. KING, S. J.
Director of Studies, Dean College of Arts and Sciences.

*CLARENCE CHARLES COOLIDGE
Law
Dean Emeritus of the College of Law
A. B., Santa Clara, 1891, J. D., 1910. Admitted to practice, 1894. Dean of the College of Law, 1919-34. At Santa Clara since 1909.

EDWIN JOHN OWENS
Law
Dean of the College of Law
A. B., Holy Cross, 1919; LL. B., Harvard, 1922. Admitted to practice, Massachusetts, 1922; United States District Court, 1927. Professor of Law, Boston College, 1928-33. Dean of the College of Law since 1934. At Santa Clara since 1933.

GEORGE LEONARD SULLIVAN
Engineering
Dean of the College of Engineering
B. Sc. in M. E., University of Nebraska, 1908; M. E., University of Colorado, 1910; Ph. D., Santa Clara, 1914. Instructor in Mechanical Engineering, University of Colorado, 1908-11; Assistant Professor of Mechanical Engineering, Montana State College, 1911-12; Phelps-Dodge Corporation, 1918 (on leave from Santa Clara). Dean of the College of Engineering since 1918. At Santa Clara since 1912.

CHARLES J. DIRKSEN
Economics
Dean of the College of Business Administration
B. S. C., St. Louis University; M. S. C., 1938; Instructor in Economics, St. Louis University, 1937-1938; Graduate work, University of Illinois; Private Marketing and Advertising Consultant, 1934-1937; Dean of the College of Business Administration since 1942. At Santa Clara since 1938.

† Assumed Office, October 30, 1945
‡ Resigned Office, October 30, 1945
* Deceased, January 11, 1946

WALTER E. SCHMIDT, S. J.
Religion
Dean of Men

EDWARD ALEXANDER AMARAL, M. D.
Visiting Physician

ROBERT O. ANDERSON
Economics
A.B., University of Washington, 1934; Instructor in Accounting, University of Oregon, 1937-1941; Passed examination for Certified Public Accountant, State of Oregon, 1941. At Santa Clara since 1942.

HUNTER SHERMAN ARMSTRONG
Law, Professor Emeritus
LL.B., University of Cincinnati, 1885; A.B., Marietta College, 1889; LL. D., Santa Clara, 1930. Admitted to practice, Ohio, 1886; California, 1930. General law practice, 1891-1910; Solicitor, Law Department, Pennsylvania Railway Company, 1910-27. At Santa Clara since 1927.

EUGENE MICHAEL BACIGALUPI, S. J., Ph. D.
Physics
Chairman, Department of Science.

GEORGE ALBERT BARSI
Physical Education
B. S. (in Econ.), Santa Clara, 1930; B. S. (in Ph. Ed.), St. Thomas, 1933; Graduate Student in Phys. Educ., New York U., 1934. Instructor in Physical Education and Director of Football and Basketball, College of St. Thomas, 1934-35. At Santa Clara since 1935.

DANIEL BASSETT, S. J.
English, Latin

JAMES MARIUS BECCHETTI
Commercial Law
A. B., Santa Clara, 1925, LL. B., 1926. At Santa Clara since January, 1930.

EDWIN ALANSON BEILHARZ
History, Political Science
Chairman, Department of History
A. B., Creighton University, 1931; M. A., The University of Nebraska, 1934. Principal, Roseland High School, Roseland, Nebraska, 1931-1933. University Fellow in History, University of California, 1934-1935. Emmanuel S. Heller Memorial Scholar in History, University of California, 1935-1936. At Santa Clara since 1936.

EDWARD RICHARD BOLAND, S. J.
Librarian

LLOYD LAWRENCE BOLTON
Biology
B. A., University of British Columbia, 1922, M. A., 1924; Ph. D., Cornell, 1932. Assistant in Biology, University of British Columbia, 1922-24; Graduate Student, University of Toronto, 1924-26; Research Assistant, International Fish-

eries Commission, Seattle, 1926-27; Assistant in Histology and Embryology, Cornell, 1927-28 and 1931-32; Instructor in Biology, University of Saskatchewan, 1928-29; Instructor in Zoölogy, University of Washington, 1929-31. At Santa Clara since 1932.

JOSEPH S. BRUSHER, S. J.
History, English

WILLIAM G. BURMAN, S. J.
Greek, Latin

WILLIAM J. CAHILL, S. J.
Greek, Latin

LEONARD JOSEPH CASANOVA
Education
Assistant Director Football and Intra-mural Sports
Ph. B., Santa Clara, 1927. Football Director, Belmont Boys' School, 1927-1928; Sequoia Union High School, 1928-1936. At Santa Clara since 1936.

JOHN W. CLIFFORD, S. J.
Classical Languages

RAYMOND F. COPELAND, S. J.
History

JOHN JOSEPH COTTRELL
Director of Baseball at Santa Clara since 1946.

GORDON D. CRAIG
Engineering
B. S. in Mechanical Engineering, Purdue University 1939
At Santa Clara since 1946.

WILFRED HENRY CROWLEY, S. J.
Philosophy

LESTER A. DAUGHERTY
Military Science and Tactics
A. B., University of California, 1916; Graduate, l'Ecole Militaire d'Artillerie; Graduate, United States Army Field Artillery School; Assistant Professor Military Science and Tactics, University of Illinois, 1929-33; Colonel, Field Artillery, United States Army At Santa Clara since 1946.

JOSEPH F. DECK
Chemistry
A. B., St. Louis University, 1928; M. S., 1930; Graduate work, University of Michigan, 1929; Ph. D., University of Kansas, 1932. Research Chemist, Stewart Inso Board Corporation, 1932-1935; Quality Supervisor, United States Gypsum Company, South St. Joseph, Missouri, 1935-1936. At Santa Clara since 1936.

CORNELIUS FRANCIS DEENEY, S. J., Ph. D.
Political Science
Chairman, Department of Political Science.

DEWARD, Ralph Joseph, S. J.
Asst. Director of Discipline

PHILIP HUGH DIRSTINE
Chemistry

B. S., Gonzaga University, 1936; M. S., University of Washington, 1938; Ph.D., Stanford University, 1942; Teaching Assistant, Stanford University, 1938-41; Research Associate, University of California at Los Angeles, 1944-45; Research Chemist, Dow Chemical Company, 1941-44. At Santa Clara since 1946.

REINHOLD A. DOERGE, S. J.
German

HUGH COLUMBUS DONAVON, S. J.
Religion
Chairman, Department of Religion

JOHN D. DRYDEN, S. J.
English

H. SYRIL DUSENBERY
Engineering
B. S. in Electrical Engineering, University of California, 1917. Supervisor Electrical Training, Moore Dry Dock Co., Oakland, 1942-45. At Santa Clara since 1946.

AUSTIN JOSEPH FAGOTHEY, S. J.
Philosophy
Chairman, Department of Philosophy.

WILLIAM JOHN FINNIGAN, S.J.
Latin, Greek

FLOYD GRAYSTONE FISHER
Mathematics
A. B., University of California, 1932; M. A., 1933; Ph. D., 1937. Teaching Assistant in Mathematics at University of California, 1933-1936. At Santa Clara since 1936.

FRANCIS RICHARD FLAIM
Biology
A. B., University of Utah, 1936; M. A., 1938. Assistant in Zoology, University of Utah, 1934-35. Teaching Fellowship in Biology, University of Utah, 1935-1938. At Santa Clara since 1938.

EDMUND CLARENCE FLYNN
Engineering
B. S. in C. E., Colorado College, 1919; M. S., Iowa State College, 1925. Assistant Professor (Highway Engineering and allied subjects), Iowa State College, 1921-30. At Santa Clara since 1930.

† JAMES WILLIAM FOLEY
Commercial Law
A.B., Santa Clara, 1933; LL.B., Stanford, 1936. Admitted to practice, California, 1936. At Santa Clara since January, 1939.

*FREDERICK C. GERLACH, M. D., LL. D.
Visiting Physician and Surgeon.

GEORGE ALDEN GILBERT, S. J.
Curator of Museums

† On leave with the Armed Forces
* Deceased

MARTIN CHRISTOPHER GLAVINA
German

A. B., California, 1926, A. M. 1928; Student, School of Education, University of California, 1929-30. Teaching Assistant, University of California, 1923-24. Graduate Student, Stanford University, 1932-35. At Santa Clara since 1930.

ROBERT EMMET HAYES
Law

A. B., Holy Cross, 1926; LL.B., Boston College, 1933. Admitted to practice, Massachusetts, 1933. At Santa Clara since 1934.

RICHARD MANNING HERMES
Mathematics

B. E. E., Santa Clara, 1934; M. A., Stanford University, 1938. At Santa Clara since 1935.

BERYL MARGARET HOSKIN
Assistant Librarian

B.A., San Jose State College, 1934. At Santa Clara since 1940.

*BERNARD ROSECRANS HUBBARD, S. J.
Geology

DANIEL J.KELLEHER, S. J.
Latin, Greek

†JOSEPH P. KELLY
Law

Ph.B., Holy Cross College, 1933; J.D., New York University, 1936; LL.M., 1939. Admitted to practice, New York, 1937. At Santa Clara since 1939.

SAMUEL A. KNAPP
Engineering

Journeyman Machinist; Instructor in Shop. At Santa Clara since 1943.

*STANLEY JOHN KOCAL
Engineering

B. S. in C. E., Michigan College of Mining and Technology, 1935; M.S., Michigan State College, 1940; Instructor of Surveying, Michigan College of Mining and Technology, Summer term, 1935; Graduate Assistant in Civil Engineering, Michigan State College, 1936-1937; Michigan State Highway, Department, 1937-1938; Instructor in Civil Engineering, North Dakota State College, 1938-1941; Illinois State Highway Department, Summer of 1941. At Santa Clara since 1941.

FENTON JOHN McKENNA
Dramatics, Public Speaking

Ph. B., Santa Clara, 1928, LL. B., 1930, J. D., 1933. Instructor in English and Public Speaking, Bellarmine College Preparatory, San Jose, 1928-30. At Santa Clara since 1930.

RICHARD WALLACE MORTON
Law

A.B., Santa Clara, 1937; LL.B., 1939. At Santa Clara since 1940.

* On leave.
† On leave with the Armed Forces.

LAURENCE ANTHONY MULLINS
Director of Football
A. B., University of Notre Dame, 1931. At Santa Clara since 1946.

WALTER THOMAS NACHOD
Assistant Librarian
Ph.D., University of Leipzig, 1908. At Santa Clara since 1939.

ALBERT JOSEPH NEWLIN
Associate in Meteorology and Seismology
B. S., Santa Clara, 1913, LL. B., 1914, J. D. 1916, D. Sc. 1934. At Santa Clara since 1918.

BLANCHE LOUISE NIELSEN
Registrar
At Santa Clara since 1942.

†JOHN PAGANI, JR.
Economics
B. C. S., University of Santa Clara, 1932. Teaching Assistant in Economics, University of California, 1932-1934; Acting Instructor in Economics, Stanford University, 1941-1942. At Santa Clara since 1934.

*PAUL J. PHELAN
English
B. A., St. Peter's College, 1935; M. A., Fordham University 1938; Instructor in English, Fordham University, 1938-1941. At Santa Clara since 1941.

J. SHELBURN ROBISON
Military Science and Tactics
B. S., Mining Engineering, Pennsylvania State College, 1917; LL.B., University of San Francisco, 1934; eligibility for practice of Law, New Mexico, established in 1935; admitted to practice of Law, California, 1936; Captain, Field Artillery, United States Army, Graduate of Field Artillery School. At Santa Clara since March, 1942.

PAUL MELVIN ROLL
Chemistry
B. S., Santa Clara, 1935; California Chemical Company, 1935 1936; M. A. Stanford University, 1943; Teaching Assistant in Biochemistry, Stanford University, 1943-44; At Santa Clara since 1936.

RICHARD M. SCHMIDT
English
A. B., University of Santa Clara, 1935; M. A., University of Washington, 1945. At Santa Clara since 1946.

FRANCIS J. SEELIGER, S. J.
Ascetical Theology

EDWARD SHIPSEY, S. J.
English
Chairman, Department of English.

FRANCIS J. SILVA, S. J.
English, Public Speaking.

† On leave with the Armed Forces.
* On leave.

GEORGE LAURENCE SINGEWALD
Bursar
B. C. S., Santa Clara, 1931. At Santa Clara since 1937.

FERDINAND J. SPIELER, S. J.
Physics

†GEORGE JAMES STEPOVICH
Law
Ph. B., University of Santa Clara, 1933; LL. B., 1935; Graduate Student in Law, Stanford University, 1935-1937. At Santa Clara since 1937.

HOWARD STONE
Spanish
A.B., Pomona College, 1931; M.A., Claremont Colleges, 1932; Ph.D., University of California, 1941; Teaching Assistant, Department of French, University of California, 1937-1941. At Santa Clara since 1942.

JAMES HENRY STREHL, S. J.
Superintendent of Grounds and Buildings

DONALD FRANCIS ST. SURE, S. J.
Latin, Greek

WILLIAM J. TOBIN
Economics

THOMAS J. TROUP
Mathematics
B. S. in Chemical Engineering, University of Wisconsin, 1945. At Santa Clara since 1945

VIRGINA S. VIRSHEK
Assistant Librarian
B. S., The College of St. Catherine (St. Paul, Minn.), 1943; Asst. Librarian, Schick General Hospital Library, (Clinton, Iowa), June-Dec., 1945. At Santa Clara since 1946

HENRY WALSH, S. J.
Religion

WILLIAM JOSEPH WARREN
Engineering
B. S., (E.E.) University of Santa Clara, 1931; Ph.D. (Eng'g.) University of Illinois 1936; Assistant in E. E., University of Illinois 1934-1935; Instructor in E. E., University of Illinois 1935-1937; General Electric Company 1937-1938; Associate in E. E., University of Illinois 1938-1941; At Santa Clara Santa Clara since 1932.

ERNEST PAUL WATSON, S.J.
Secretary and Treasurer

JOHN ANTHONY WEBER, S.J.
Director of the Richard Memorial Observatory

CHESTER G. YOUNG
Mathematics
A. B., San Diego State College, 1936. Teacher and Vice-Principal, Lemoore Union Elementary School, 1939- 1942; at Santa Clara since 1946.

† On leave with the Armed Forces.

FACULTY COMMITTEES

ATTENDANCE—The Director of Studies and the Director of Discipline.

CREDENTIALS AND REGISTRATION—The Director of Studies, Deans of various Colleges, and the Director of Discipline.

DISCIPLINE—The Director of Discipline and the Director of Studies.

DRAMATICS AND PUBLIC EXERCISES—The President, the Director of Studies, the Director of Discipline, and the Director of Dramatics.

EXAMINATIONS—The President, the Director of Studies, and the Professors of the various courses.

SCHOLASTIC STANDING—The Director of Studies and the Deans of the several Colleges.

STUDENT ORGANIZATIONS—The Director of Studies, the Director of Discipline and the Director of each organization.

STUDENT PUBLICATIONS—The Director of Studies, the Director of Discipline and the Faculty Moderator.

THESES—The Director of Studies and the Professors of the Upper Division Courses.

ATHLETICS—Board of Athletic Control. Two members of the faculty chosen by the President of the University, and five members of the Alumni Association also chosen by the President.

Advisory Board of Athletics. The deans of the constituent colleges and four members of the Alumni Association chosen by the President of the University.

GENERAL INFORMATION

LOCATION

The University of Santa Clara, conducted by the Jesuit Fathers, is situated at Santa Clara on the site of the old Mission, in the southern part of the San Francisco metropolitan district and immediately adjacent to San Jose. Frequent railroad and bus service provides easy access to the various Bay cities, and direct connections to all parts of California and the West.

The valley of Santa Clara is famous throughout the world for the beauty of its scenery, the salubrity of its climate, and the excellence of its fruits. The climate is mild and equable both in summer and winter, and on that account singularly favorable for persistent study and research as well as for the maximum of agreeable out-of-doors recreation which such work makes necessary.

HISTORY

Mission Santa Clara. On January 12, 1777, two Franciscan Padres, de la Pena and Murguia, planted the Mission Cross and laid the foundations of Mission Santa Clara on the banks of the Guadalupe, about a mile and a half from the University grounds. Two years later a flood destroyed both church and monastery, and the Padres in consequence removed the Mission to the second site, two blocks from the present church. There, on November 9, 1781, they laid the foundation of a large adobe church and mission buildings. Three years later, on May 15, 1784, the new church was dedicated by the Venerable Padre Serra, then Padre Presidente of the Missions of California.

Owing to damage by earthquakes in 1812 and 1818 the Padres were forced to build anew and this time selected the site of the present Mission. There, on August 11, 1822, a still larger church was dedicated. With the passing of time the original church was largely rebuilt, though the chancel and the interior arrangements remained substantially as originally constructed. In October, 1926, the Mission was destroyed by fire and rebuilt in 1927, along the lines of the original structure. This new Mission was dedicated in 1928. The restoration of the Mission was made possible by the generosity of friends in the Santa Clara Valley as well as friends and Alumni of the University throughout the State of California.

In 1836 Mission Santa Clara was secularized and passed from the hands of the devoted Padres into those of politicians, who robbed the Mission of her lands and oppressed or drove away her children. When Rt. Rev. Joseph Sadoc Alemany, O. P., arrived as Bishop of the Diocese of San Francisco in 1850, he found only one Franciscan in charge of the Mission, which had been restored by the American government, though in a sadly reduced form.

Santa Clara College. Desiring to save the remnants of the Mission, and also to start a college to meet the growing need of the times, the Bishop invited the Society of Jesus to Santa Clara. The

invitation was accepted, and accordingly on March 19, 1851, Father John Nobili laid the foundation of Santa Clara College.

He adapted the old adobe buildings to the requirements of a college. On April 28, 1855, the institution was chartered a University and continued to be known as Santa Clara College until 1912. It is the oldest institution of higher learning in the west. In 1857 the degree of A. B. was conferred on Thomas I. Bergin, the first to receive that degree from any California college.

During the subsequent years the College grew in influence and attendance. Several large new buildings were added, and for many years Santa Clara College, in both equipment and scholastic standing, ranked as the leading educational institution in the west. In its sixty years of existence as a college over seven thousand students were matriculated.

THE UNIVERSITY. In 1907 lectures were commenced with a view of preparing students to enter upon the professional courses in law, medicine and engineering. In 1911 the pre-medical course was established and the law school begun. Realizing, therefore, that the College was practically doing the work of a university, the President, Father James P. Morrissey, S. J., and the Board of Trustees adopted officially the name of "The University of Santa Clara," this decision going into effect on April 29, 1912.

In the summer of 1912, engineers of high standing were engaged to carry on the courses in engineering, and in the next summer a thoroughly equipped laboratory for engineering was prepared. In the same year the amount of work required of law students was increased and the classes in Law were thenceforth held at night.

The outbreak of the War suspended the plans for expansion and it was not until after its close that they were resumed. In 1923 an extensive building program was commenced, with a view to provide an adequate material basis for the University, and during the following years there has been added a group of new buildings, including Alumni Science Hall, 1923; Montgomery Laboratories, Seifert Gymnasium, Kenna Hall and the Service Building, 1924; Donohoe Infirmary, 1925; the remodeling of the Auditorium in 1926; the Ricard Memorial Observatory, the Seismological and Meteorological Stations, the New Mission Church in 1928, Nobili Hall in 1930, the Varsi Library in 1931, and Bergin Hall in 1938.

Accompanying the Building Program there has come a corresponding growth in attendance and scholastic work. In 1923 the Pre-Medical course was restored, and a four year College of Business Administration added. In 1925 the College of Law was increased to four years; and the Preparatory Department transferred to a separate campus on the former property of the College of the Pacific at College Park, San Jose. In 1926 the University celebrated its Diamond Jubilee and with enlarged facilities and equipment entered upon a program of greater service to the Church and state. In August, 1929, plans were formulated whereby the standing of the College of Law would be greatly increased. Since August, 1930, all classes in the College of Law previously held at night have been taught under the new plan as morning classes. This plan put the College of Law on a basis more in accordance with the standards of the American Bar Association.

SYSTEM OF EDUCATION

The Jesuit system of education aims at developing side by side the moral and intellectual faculties of the student, at sending forth to the world men of sound judgment, of acute and rounded intellect, of upright and manly conscience. And since men are not made better citizens by the mere acquisition of knowledge, without a guiding and controlling force, the principal faculties to be developed are the moral faculties. Moreover, morality is to be taught continuously. It must be the underlying base, the vital force supporting and animating the whole organic structure of education. It must be the atmosphere the student breathes. It must suffuse with its light all that he reads, illuminating what is noble and exposing what is base, giving to the true and false their relative light and shade.

Because of its conservative system of education, its solid philosophical system and the highly specialized training required of those who qualify as professors, the University of Santa Clara is particularly prepared to train leaders of men.

Though the Catholic Religion is the religion professed by the Faculty and by the larger number of the students, members of all religions are admitted provided they are willing, for the sake of order and uniformity, to conform respectfully to the religious observances of the University.

GROUNDS AND BUILDINGS

The Campus. The University occupies a well laid out campus of approximately fifteen acres facing the Alameda, on El Camino Real from San Francisco to Los Angeles—the site of the third Mission Santa Clara. The buildings are grouped in a series of quadrangles around the Mission church in accordance with the Campus Plan prepared by Mr. John J. Donovan, which provides for a continuation of the original Mission style.

Mission Santa Clara, built in 1822, and the Students' Chapel, built in 1887, were destroyed by fire on October 25, 1926. Through the generosity of Alumni and friends of the University, a new Mission Church, a replica of the original church, stands on the former site, the heart and center of University activities. It serves as the Students' Chapel and enshrines the priceless relics of the old Mission rescued from the fire by the heroic efforts of the Faculty and students.

The Administration Building built in 1911 to replace the old Fathers' Building destroyed by fire in 1909. It contains the administrative offices of the University, reception rooms, residences of the Fathers and Scholastics and the Faculty Library.

O'Connor Hall, built in 1912, is the gift of Mr. and Mrs. Myles P. O'Connor. On the first floor are the class-rooms of the College of Arts and Sciences. The second and third floors contain private rooms for the upper class-men. In the basement are the cooperative bookstore and recreational facilities of the Associated Students, and the Paleontological and Geological Museums.

The Theatre, originally built in 1870 and completely reconstructed in 1926, is one of the largest theatres for amateur productions in the West, and has been the scene of such notable dramatic productions as the Passion Play and the Mission Play of Santa Clara.

Alumni Science Hall, built in 1924, is the gift of the Alumni of Santa Clara and contains offices, lecture rooms and laboratories of the

Departments of Biology, Chemistry and Physics; and the electrical equipment service rooms.

Robert E. Kenna Hall, erected in 1924, is dedicated to Rev. Robert Emmet Kenna, S. J., student, professor and twice president of Santa Clara College. On the first floor are the offices, class rooms, laboratories and library of the College of Business Administration; and class rooms for the lower division classes. The two upper floors contain private rooms for the lower division students.

Montgomery Laboratories, erected in 1924, are dedicated to John J. Montgomery, "Father of Aviation," one time Professor of Physics in the University. On the first floor are the materials testing, mechanical, and electrical laboratories of the College of Engineering, together with office and lockers for laboratory classes. In 1930 a second story was added, in which are contained drawing and lecture rooms for Engineering students.

Seifert Gymnasium, erected in 1924, is a bequest of the late Dr. George W. Seifert, B. S. '79. It houses the plunge (40x100x10), the basketball court (65x100), locker rooms for Varsity and class teams, music rooms and students' lounging room, and is the center of social life at the University.

The Service Building, erected in 1924, houses the laundry, power and heating plant, and service rooms. The second floor provides a dormitory for employees.

Donohoe Infirmary, erected in 1925, is the gift of Miss Katherine Donohoe in memory of her father and mother, James and Rose Donohoe. It is a complete small hospital, with private rooms and ward, diet kitchen, dispensary, operating room, chapel, and offices for the infirmarian and visiting physician.

The Ricard Memorial Observatory is the gift of the Knights of Columbus of California to the "Padre of the Rains." This building, with its three domes, houses the telescopes, the spectroheliograph and other instruments. An underground passageway connects the vault of the Seismic Station to the Observatory. The new Seismic Station contains the 80Kg Wiechert Horizontal and Vertical Seismographs, three new Galitzin Seismographs of the long range type and the two new Wood-Anderson Seismographs, especially designed for local earthquakes. A specially constructed clock niche in the vault will contain a "Shortt Synchronome Clock" and will be kept at a constant temperature by means of a highly sensitive thermostatic control. The Observatory likewise houses the other necessities of a station of this type, such as battery rooms, photographic dark rooms and offices where records are kept for study and reference.

Nobili Hall, erected in 1930, is dedicated to the Rev. John Nobili, S. J., the first president of the University. On the first floor are the refectories for the Fathers, lay faculty, students, guests and employes; kitchens and service rooms. The second floor contains rooms for the lay professors as well as for the students. The third and fourth floors have rooms reserved entirely for students.

The Library. Construction of Varsi Library commenced on March 12, 1931 and the building was dedicated on October 10, 1931. The first floor has private study rooms for the Faculty, departmental reading rooms, offices of the librarians, students' reading room and

stack room. In the stack room provision is made for 120,000 volumes, allowing for expansion. The main reading room affords simultaneous accommodations for one hundred and seventy-five readers. The Library was made possible through the generosity of a distinguished alumnus of Santa Clara. It was named the Varsi Library in honor of the sixth President of Santa Clara, a life-long friend of the donor.

Bergin Hall is the gift to Alma Mater of her first graduate, Hon. Thomas I. Bergin, A. B. '57. This building is used exclusively for the College of Law and contains the library, moot court, conference rooms for students and faculty, classrooms and offices of the Law Faculty.

LABORATORIES

The laboratories of the departments of Biology, Chemistry and Physics are located on the three floors of the Alumni Science Hall.

The laboratories of the College of Engineering are located in the Montgomery Laboratories and provide complete laboratory facilities for engineering courses.

The Astronomical, Seismological and Meteorological laboratories are located in the Observatory group.

ENDOWMENT AND NEW BUILDINGS

The growth in the number of students and the work of the University has made it imperative that adequate buildings and endowment be provided. For this, and in order that Santa Clara may widen its scope as an educational institution of recognized standing, funds are necessary. Santa Clara stands in imperative need of an endowment. The work the University has accomplished in the past is an earnest of what she will do when increased facilities are afforded her.

An endowment, however, implies a founder or founders and benefactors. During the past few years, many have helped the University and generous donations have been made. The new Mission Church, Administration Building, Donohoe Infirmary, Bergin, O'Connor, and Alumni Science Halls, Seifert Gymnasium, Ricard Memorial Observatory, Nobili Hall and Varsi Library are inspiring examples of such support.

But before other buildings, for which the plans of the University provide, may be added, further benefactions will be needed. Other institutions, even those state-aided and richly endowed, receive generous assistance in their work and hesitate not to ask for it. Santa Clara feels that generous friends are not lacking, though for the want of deeper thought on the matter, few realize the importance of Christian educational work, the immense sacrifice it entails, and the merit there is in coöperating and sharing with Christian educators in their work for God and country and the welfare of the young men of our generation.

The Jesuit Faculty of the University has given its life-services freely and gladly to the work. Those who would share with them in this great enterprise can do so most effectively by rendering material aid and contributing funds for the continuance and development of the work.

FORM OF BEQUEST

I give and bequeath unto the President and the Board of Trustees of Santa Clara College, a corporation duly incorporated under the laws of the State of California, a sum of.....dollars.

SCHOLARSHIPS

Every year deserving young men of high character and aspirations, whose means do not permit their attending the University, appeal to the Faculty for assistance to obtain the education for which their talents and vocations fit them. There is scarcely a university in the United States which is not provided with a fund for this purpose, and a relatively large per cent of successful college men spring from the class of assisted students. To contribute to such a purpose is clearly a noble benefaction. But this is especially so with regard to those who apply for help to the University of Santa Clara. They are as a rule young men of high standing, who understand the paramount value of an education in a university which aims at the highest intellectual development of the student, while devoting no less attention to the perfect development of his moral character. As a consequence, to assist them in attaining their desire is to aid picked young men whose future is more than ordinarily full of promise, and who are destined to exert a most powerful influence on those among whom their lives will be spent.

Through the generosity of friends of the University a few such scholarships have recently been established, but there is need for many additional scholarships, either through permanent endowment or by annual gifts.

STUDENT ORGANIZATIONS

College life must include the development of the social side of every student's character. Marked initiative and leadership in organized religious and social movements for the common welfare of his fellows, are qualities expected of college men generally. For this purpose the University student organizations and activities furnish splendid opportunity.

RELIGIOUS ACTIVITIES

As the first thought of the University is the encouragement of a sound religious life on the part of the student body, special attention is given to those sodalities and religious organizations sponsored by the Church, some of which have existed at Santa Clara for more than three quarters of a century.

Sodality of the Immaculate Conception. Its object is to promote in its members a special and filial devotion to the Immaculate Mother of God, to imitate her virtues, to encourage, both by word and example, an eminent purity of morals and a manly fidelity to the practice of religion.

The League of the Sacred Heart. The object of this Association is to foster in the students an earnest religious spirit, particularly a deep and tender love towards our Lord in the Sacrament of His Love, and a consequent reparation for the offenses committed against Him. To this end the First Friday Communion is zealously encouraged.

The Saint John Berchmans' Sanctuary Society. This society has as members those students who as a reward for good conduct and exact application to their studies have been allowed to serve at Mass and assist at the other services in the College chapel.

Holy Name Society. The purpose of this society is the public manifestation of belief in the Divinity of our Lord Jesus Christ.

DRAMATICS

An exceptionally high standard of dramatics has been set at Santa Clara from the beginning. Earliest records show that classical productions were quite the accepted thing even in the fifties, nor have traditions changed. In consequence of this, students acquire a rare facility of expression and unusual ease in public appearances.

Each year a major dramatic production is staged, giving opportunity to a large proportion of the student body to participate. In the past these productions have included such notable performances as "The Mission Play of Santa Clara" and "The Light Eternal" by Martin V. Merle '06, and "The Passion Play of Santa Clara" and "The Weaver of Tarsus" by Clay M. Greene, '69.

DEBATING

The standard of debating is on a par with that of dramatics. In addition to the various debating societies intercollegiate debates are arranged each year with representative colleges and universities.

The Literary Congress held its first meeting on February 22, 1857, and has since then furnished its members an opportunity for exercise in debating and other forms of public speaking. It consists of two Houses, the Philalethic Senate and the House of Philhistorians.

The Stephen M. White Debating Society, established October 14, 1922, has for its object the fostering of debating and public speaking among Freshmen in the College of Liberal Arts.

MUSIC

The University Band and Orchestra furnish their members with the opportunity for ensemble playing at the public exercises of the University.

The University Choir and Glee Club furnish vocal music for Chapel services and the public exercises of the University.

ATHLETICS

Athletics at Santa Clara are under faculty control through the Board of Athletic Control and the Faculty Moderator, by whom arrangements for intercollegiate and intramural contests are made.

In direct charge of Athletics and Physical Training is the Director of Physical Education, who is assisted by professional coaches in the various major activities.

Block S. C. Society. Members of the university teams who have secured the university letter are organized into the Block S. C. So-

ciety in recognition of their athletic ability and for the encouragement of a high standard of athletic conduct.

The Athletic Managers Association is composed of volunteers from each class who cooperate with the management in the conduct of games and the care of equipment.

ALUMNI ASSOCIATION

The object of this association is to strengthen and perpetuate college friendships, to preserve in former students a warm regard for Alma Mater and a lively memory of the substantial benefits she has bestowed, to cherish and advance her interests, to maintain her honor and sustain her reputation by manly and honorable conduct.

Officers of the Association are:

Harold R. McKinnon, A. B., '14; LL.B., '15,President
Warren S. Morey, A. B. '34, First Vice President
Baldo A. Ivancovich, Com'l Cert., '04, Second Vice President
Robert E. Grady, in E. E., '23; - E. E., '26, Third Vice President
John V. Filippini, A. B., '00, Treasurer
Paul F. Kelly, B. S., '38, Secretary

PUBLICATIONS

The "Santa Clara." The "Santa Clara" is the official weekly newspaper of the University. The aim of the "Santa Clara" is: To publish the news of the University, to aid in constructive work, and to afford the students of Journalism an opportunity for actual practice in newspaper editing, managing and make-up.

The "Redwood." The "Redwood" is the University annual published by the students to serve as a medium for literary work of more than passing merit, as a record of University activities, and as an expression of the student life of the University.

The "Owl." The "Owl" is the monthly literary supplement of the "Santa Clara." This publication offers a medium for literary work among the students. The name was taken from the first literary magazine of the University.

STUDENT CONGRESS OF THE UNIVERSITY

The Student Congress of the University is the student body organized for the encouragement of student activities, particularly athletics, and such other work as may be recommended by the Faculty.

The Faculty Club. This is an organization of the religious and lay members of the Faculty, organized as a means to become better acquainted with the problems confronting the various departments and to mould the Faculty into a solid working unit. Educational, scientific and ethical problems are discussed by the members. Men of prominence in public affairs as well as educators from other universities are invited from time to time to address the Faculty Club on subjects of particular interest.

Alpha Sigma Nu. Alpha Sigma Nu is a National Honor Society with chapters in various Jesuit Colleges and Universities throughout the United States. It is a society organized of honor students who have distinguished themselves in Scholarship, Service and Loyalty to their College or University.

Each department of the University has its own organization for the study of technical problems and for the encouragement of social life among the students of the department.

The Engineering Society. This is an organization made up of students in the College of Engineering with the object of familiarizing them with the conduct of meetings of public bodies and the acquisition of ease in public speaking. Lectures to the engineering students are given before this body.

The Business Administration Association. This is an organization of students in the College of Business Administration for the study of business problems and for the encouragement of social activities among the students of the College. Frequent lectures are given before the Association by business men of prominence.

Mendel Club. This is an association of students preparing for the study of medicine, organized for the study of scientific subjects and the encouragement of such activities as are of particular interest to the students of this department.

The Woolsack. This is an organization of students in the College of Law for the discussion of legal subjects, for the encouragement of social activities among the students of Law, and for the upbuilding of the Law work of the University.

The Arts Society. This organization is made up of students of the College of Arts and Sciences whose object is to create and foster literary talent among the students and to preserve the classical traditions for which the University has been noted for more than seventy-five years.

The International Relations Club. This is an association of the students interested chiefly in Political Science. The purpose of this organization is the study of international problems of both the past and the future. It is affiliated to the Carnegie International Clubs.

The Galtes Chemistry Society. This organization is made up of students in the department of Chemistry whose object is to encourage the students in the study of Chemistry and to further such activities as are of interest to students of Chemistry.

EXPENSES

Resident Students

Tuition, per semester	$150.00
Board and Lodging, per semester	250.00
Deposit for Laundry, per semester	20.00
Room Deposit	10.00
Professional Medical Fee, per semester	10.00
Deposit for Books, per semester:	
Law Students	35.00
Engineering Students	30.00
Other Students	20.00

Non-Resident Students

Board and Lodging, per semester	250.00

For All Students

Matriculation Fee, paid at first entrance only	10.00
Student Activity Fee, per semester	10.00
Library Fee, per semester	10.00
Law Library Fee, per semester	10.00

Military Science Fees and Deposits

First year students	12.00
Second year students	5.00

Special Charges

For registration on the first day after the opening of semester	2.50
For each day thereafter	1.00
For each examination taken out of time or to remove a condition	2.00
For course in Subject "A," each time	5.00
For each syllabus (synopsis of semester's work in any subject furnished by professor)	2.00
For each copy of the student's record other than the first	2.00
Laboratory Fees, per semester:	
Physics, each course	12.50
Engineering, Freshman and Sophomore,	10.00
Engineering, Junior and Senior	25.00
Engineering, Jun., Sub-Sen., Sen., (five year plan)	17.00
Engineering, Summer Surveying (Tuition)	25.00
Biology 21, 22, 101, 102, each	15.00
Biology 23, 24, each	12.50
Biology 103, 107, each	7.50
Biology 105, 106, 109, each	5.00
Biology 108, per unit	2.50
Chemistry 5, 6, 11, 12, each	12.50
Chemistry 9, 10, 17, 130, 131, 150, 151, each	15.00
Deposit in all laboratories to cover breakage, etc.	5.00
Graduation Diplomas and Certificates	10.00

The rental for private rooms covers charges for light, heat and care. No additional electrical appliances may be installed by students without permission of the Vice-President and the payment of extra charges.

An extra charge of $25 for Board and Lodging will be made for each student living at the University during the Christmas Recess.

Pocket Money and Incidentals

The amount of pocket money and money for incidentals is left entirely to parents and guardians. The University prefers that parents deal directly wih the students. Should, however, parents or guardians wish the Treasurer of the University to look after these matters, they must deposit a sufficient amount with him and instruct him how the money is to be used. The University does not advance money for these purposes.

Infirmary Charges

Charges for the ordinary attendance of the University Physician, Nurse and attendants are provided for by the Professional Medical Fee. Medicines are charged at cost prices. For a room in the Infirmary, a dollar a day is charged.

Payments

All charges must be paid half-yearly in advance. Remittances should be made in the name of the University of Santa Clara. Deferred payments of bills or reductions can be sanctioned only by the President. For such a concession a fee of $1.00 per month will be charged for each $200.00 or fraction thereof remaining unpaid. If payment is deferred without a satisfactory understanding with the President, the latter is directed by the Trustees to remove the stu-

dent in question from the institution. Semester bills and unpaid balances are subject to sight draft ten days after the bill is rendered

It is distinctly understood that no student is entitled to take any semester examination or receive any diploma or degree or be furnished with a record of his credits while any bills due the University remain unpaid.

When a student is withdrawn temporarily or permanently from the University the Vice-President must be directly informed, and money supplied for traveling expenses.

Refunds

There will be no refund made on Fees or Special Charges.

Refund on Tuition will be prorated quarterly according to the following plan: Any student withdrawing prior to November 15th or April 15th will have refunds made for the second half of the semester. No refund will be made for students withdrawing after the above dates. Refund on Board and Lodging will be prorated weekly from the beginning of the week following the date of withdrawal. No refund will be made for withdrawal after the first day of the last month of each semester.

Articles to be Brought

The articles which every student coming to reside at the University should bring with him are, more or less: blankets, bed-covers, sufficient wearing apparel and toilet articles. Clothing to be sent to the laundry should be marked distinctly with the student's name before registration.

Student Employment

Employment is available at the University for a small number of students who need to earn the means to defray part of their school expenses. Positions range from that of waiter in the dining hall to that of secretary to a teacher. The compensation is according to the number of hours given to the work, and the amount earned is applied on the student's account with the University. Preference for employment is given to worthy students of high scholastic standing. All students so employed must carry their regular schedule with the weighted average of "C".

SCHOLARSHIPS

Besides the conditions laid down by the donors, all scholarships administered by the University are subject to the following conditions:

First: Recipients of scholarships will be chosen from among those students who have been registered at the University for at least one year.

Second: In choosing students who are to benefit by the various scholarships preference will be given to needy and deserving students.

Third: Students who are recipients of scholarships must maintain at least a C average.

Fourth: In selecting students for scholarships participation in extra-curricular activities will be taken into account in all cases. Such activities will be debating, dramatics, athletics, music and contributions to the University Weekly and Annual. Continuance in extra-curricular activities will be required of all holders of scholarships.

Fifth: Any student benefitting by a scholarship who has a semester average below passing in any subject will automatically forfeit said scholarship.

Sixth: Once a scholarship has been awarded, the student continues to benefit by it as long as he satisfies the prescribed conditions.

Seventh: Scholarships may be cancelled at any time by the Administration for any infraction of the rules and regulations of the University.

The Alice Phelan Sullivan Memorial Scholarship

This perpetual scholarship for a resident student was founded in 1912 by the gift of $12,500 from "A Friend" in memory of Mrs. Alice Phelan Sullivan of San Francisco.

The Jesse W. Bryan Memorial Scholarship

This perpetual scholarship for a resident student was founded in 1913 by the gift of $12,500 by Mrs. Sarah A. Bryan in memory of her son, Mr. Jesse W. Bryan, a former student of Santa Clara.

The James Dunne Scholarships

These perpetual scholarships were founded in 1931 by the gift of $200,000 from Mrs. Viola K. Dunne in memory of her husband James Dunne, '74. They are fifteen in number and are to be applied to resident students from the State of California

The James D. Phelan Scholarships

These perpetual scholarships were founded in 1931 by the gift of $50,000 from the Hon. James D. Phelan, Ph. D. 1903. They are twenty in number.

The Mamie H. Evans Scholarships

The fund for these perpetual scholarships was established by Mrs. Mamie H. Evans with a bequest of $9,275 in 1940. The fund to be known as the Mamie H. Evans Memorial Scholarship Fund.

The Katherine Conner Scholarships

These perpetual scholarships were founded in 1942 by the gift of $4,500 bequeathed by Katherine Conner. The fund to be known as the Katherine Conner Scholarship Fund.

The de Saisset--Filipello Scholarship

A perpetual scholarship founded by Miss Isabel de Saisset and Mrs. E. A. Filipello to be given to a student of the University designated by the President.

The Alumni Scholarship

A perpetual scholarship founded by the Alumni Association of the University to be given to a deserving student.

The John Paul Paganini Scholarship

A perpetual scholarship founded by the Charles M. Paganini family in memory of their son of the Class of 1938 who lost his life in World War II.

The Robert L. Jacobs Scholarship

A perpetual scholarship founded by friends of Robert L. Jacobs of the Class of 1945 who lost his life in World War II. This scholarship to be given to a student designated by the President of the University.

THE SEXTON SCHOLARSHIPS

These perpetual scholarships were founded in 1946 by the gift of $54,000 bequeathed by Mr. John E. Sexton. The fund to be distributed equally as follows:

The John Sexton Scholarship

In memory of the father of the donor, to be given to a resident student from El Dorado County, California.

The Catherine Sexton Scholarship

In memory of the mother of the donor, to be given to a resident student from El Dorado County, California.

The J. E. Sexton Scholarship

In memory of the donor, to be given to a resident student from Eureka County, Nevada.

THE PRESIDENT'S SCHOLARSHIPS

The following scholarships, established in 1935 by the President of the University, to be awarded to needy and deserving students:

The Edward J. Hanna Scholarship

A four-year scholarship valued at $300 annually, founded in honor of His Excellency the Most Reverend Edward J. Hanna, D. D., Archbishop of San Francisco, on the occasion of his Golden Sacerdotal Jubilee.

This scholarship is at the disposal of the Archbishop of San Francisco to be given to a graduate of the Catholic High Schools of the Archdiocese.

The St. Robert Bellarmine Scholarships

Two four-year scholarships, one for a resident student valued at $300 annually and one for a non-resident student valued at $200 annually, to be given to graduates of Bellarmine College Preparatory School who shall be deemed most deserving by the Faculty of that school.

The St. Ignatius of Loyola Scholarships

Two four-year scholarships in the College of Engineering for resident students valued at $300 annually, one to be given to a graduate of St. Ignatius High School, San Francisco and one to a graduate of Loyola High School, Los Angeles. The recipient in each case to be chosen at the discretion of the Faculties of the respective institutions.

The St. Joseph Scholarship

A four-year scholarship for a resident student valued at $200 annually, to be given to a graduate of St. Joseph's High School, Alameda, who shall be deemed most deserving by the Faculty of that institution.

LOAN FUNDS

The following loan funds are open to students of the University under such conditions as may be provided by the President:

Catala Club Loan Fund. This fund established and administered by the Catala Club is available, upon application, to students of the University.

PRIZES

The following extraordinary prizes are open to competition on the dates announced in the University Calendar. The Faculty Committee on Scholastic Standing reserves the right not to award any of these prizes in the absence of sufficient competition or a meri-

torious grade of scholarship. No one is eligible to compete a second time for a prize which he has already won, except after an interval of one year. Students who have not been in attendance for both semesters may not compete.

Nobili Medal. An annual prize of $60 founded by Joseph A. Donohoe, Esq., in honor of the first president of Santa Clara, Rev. John Nobili, S. J., to be given to the student who shall be deemed first in morals, obedience and application to study.

The Ryland Prizes. The Hon. Caius T. Ryland founded in 1897 an annual purse of $45.00, leaving its disposition to the discretion of the Faculty. This the Faculty, after due consideration, assigned to the University Literary Congress, organized February 22, 1857, establishing the Ryland Debate to be held yearly between the two branches, the Senate and the House, and divided the purse into three prizes of $20.00, $15.00 and $10.00, respectively. By an agreement between these societies, each in turn selects the subject to be debated, and the other is granted the choice of the side it will defend.

The McCann Prize. Annual prize of $15.00 founded in honor of Daniel B. McCann, B. S. '84, to be given for the best short story.

The Redwood Prize. Annual prize of $25.00 founded in 1908 by the executive committee of "The Redwood," and given for the best essay on an historical subject.

The Owl Prize. An annual prize of $25.00 founded by the directors of the former College Magazine, "The Owl," to be given to the winner of an oratorical contest in the University.

The Orella Prize. An annual award of $25.00 established in 1915 by the late Dr. Firmin R. Orella, B.S. '89, and founded in 1945 by his wife, Albertine S. Orella, to be given to the senior student in the Department of Science who attains the highest average in scientific subjects during the junior and senior years.

The William H. Leahy Prize. A gold watch, valued at $50.00. This prize was founded in honor of Mr. William H. Leahy by his wife and his brother, Mr. James Leahy, for the winner of the Dramatic Art Contest.

The Coolidge Prizes. Two gold medallions to be given to the winners of the annual Coolidge Competition, the public Moot Court session of the College of Law.

Business Administration Prize. An annual prize of $20.00 given by the faculty of the College of Business Administration to the senior in the College of Business Administration with the highest scholastic average.

The Bancroft-Whitney Company Prize. A set of law books awarded to the member of the senior class in Law having the highest average.

Two Silver Medals to be given to the following students who become most distinguished for good conduct and application to study:

1. The most distinguished **Resident** student.
2. The most distinguished **Non-Resident** student.

An Officer's Saber to be given by the Santa Clara County Chapter of the Reserve Officers' Association to the Senior who displays the highest qualities of leadership in Military Science.

U. S. Field Artillery Association Medal to be given to the Junior who displays the highest qualities of leadership in Military Science.

Two Silver Medals to be given to the following students who display the highest proficiency in Military Science:

1. The most proficient Sophomore.
2. The most proficient Freshman.

ADMISSION

General Statement

Application for admission, accompanied by scholastic credentials and testimonials of character, should be filed with the Registrar on or before August 15th. It is obligatory to submit on entrance official records from the school last previously attended, together with a transcript of record of all previous high school and college credentials. These credentials are to be forwarded directly by the proper officer of the school last attended and not through the student.

Testimonials

All applicants for admission must present satisfactory evidence of good moral character and a certificate of honorable dismissal from the school last attended. In case of an intermission of study immediately preceding registration the testimonial of good character should come from some responsible person who has been in a position to know the habits of the applicant during that time. Moreover, all applicants must at the time of registration submit the names of three persons to whom the Faculty may refer for further information regarding their character. The certificate of honorable dismissal from the school last attended should be accompanied by a letter from the principal certifying to the fitness of the candidate for successful college work.

No application for admission will be given consideration until the testimonials herein provided for have been offered.

Scholarship Credentials

Candidates for admission to any of the undergraduate courses of the University must qualify:

(a) For admission to Freshman standing:
   1. By evidence of the completion of the regular four-year high school course of the Preparatory Department of this University or of a similar course in an approved high school, or
   2. By passing an examination in subjects equivalent to fifteen standard high school units. The subjects to be presented must be arranged in advance with the University.

(b) For admission to the undergraduate course of his choice. The following are the prescribed entrance units for the respective degrees offered by the University in its various courses:

	A.B.	Ph.B. B.S. B.C.S.	Engrg.
English	3	3	3
Latin*	4		
Greek*	2		
Foreign Language*		2	2
Algebra	1	1	1½
Geometry	1	1	1½
History	2	2	1
Laboratory Science	1	1	1

*Students entering with only two units of Latin for the A. B. course or without two units of foreign language for the other courses, will be given an opportunity to make up these deficient units during the first two years of college. Both units must be in the same language.

It is strongly recommended that the unprescribed units for the Ph. B. or B. S. degrees be in Mathematics, Languages (preferably Latin) or Sciences.

No credit is ordinarily allowed for physical education or music. One unit each may be accepted for commercial subjects, vocational subjects, and mechanical drawing.

Half units will be accepted only when presented in addition to integral units in the same subject or in half year subjects which constitute a complete course in themselves, e. g., Solid Geometry. Any two of the biological sciences (Physiology, Botany, Zoology) may be combined into a continuous year's course equal to one unit.

The University reserves the right to require entrance examinations in the case of applicants whose certificates show grades below 80% in the prescribed units. Admission on school certificates is in all cases provisional and if, after admission, a student fails in any subject for which a school certificate was accepted, credit for that entrance subject may be cancelled.

A matriculation deficiency in a subject continued in the University in which the deficient student attains a grade of C (77-84), may be removed by the proper faculty, on the recommendation of the professor, with the approval of the Dean of the Faculties. Students, however, are cautioned not to assume in advance that this will be done.

Examination in Subject A

All lower division entrants in the colleges at Santa Clara must, at the time of their first registration in the University, take an examination, known as the Examination in Subject A, designed to test their ability to write English without gross errors in spelling, grammar, diction, sentence structure and punctuation.

The examination in Subject A will be given within two weeks after the opening of each semester. The papers submitted in the examination will be rated as either "passed" or "not passed." Any student who is not present at the examination in Subject A which he is required to take will be rated the same as those who have not passed the examination.

All students who do not pass in the examination in Subject A will be required to take, immediately after their failure, a course of instruction known as the Course in Subject A, without unit credit toward graduation. This course will be given each half year two hours a week for the semester, beginning one week after the examination. Every student who is required to take the course in Subject A will be charged a fee of $5 and the charge will be repeated each time he takes the course.

Admission to Advanced Standing

Admission to advanced standing is by specific action of the Committee on Credentials and Registration, which will evaluate all credits presented and determine the rating of the candidate.

Students from other institutions of recognized collegiate rank, including Junior Colleges with well established courses, may be admitted to such standing and upon such terms as the Committee shall deem equitable. Every such candidate is required, besides the prescribed testimonials of character and scholarship, to present a catalogue of the institution in which he has studied, and a full statement, duly certified, of the subjects he has therein completed and of the subjects there presented for entrance. The University reserves the right to determine after a test of at least one semester the amount of credit that the applicant may receive, and meanwhile he shall have the status of an unclassified student.

Admission of Special Students

Candidates for admission as special students must be persons of mature age who desire to take up special work in one department or in one subject with its related branches. Such special students are not candidates for a degree, but they may become candidates by satisfying the requirements for a regular course. No one will be admitted directly from a secondary school to the status of a special student. Entrance examinations in the subjects of fundamental importance for the work proposed will be assigned in practically all cases. Registration as a special student is for one semester only and no one may register for less than ten hours. Re-registration will be refused if the student has not shown earnestness and definiteness of purpose or if his work has been unsatifactory in whole or in part.

Admission of Foreign Students

Candidates for admission who come from foreign countries must present original and complete educational credentials, together with a catalogue giving full description of the courses. Provisional registration may be then given pending verification of the record and until the student concerned has successfully completed one semester's work of not less than twelve hours, when permanent matriculation may be given. Students from other than English-speaking countries must, in addition, possess sufficient knowledge of English to carry satisfactorily their class work.

RELIGIOUS TRAINING

To cultivate the heart, no less than to develop the intellectual and physical faculties of the student, is a duty kept constantly and sacredly in view.

As the Faculty of the University profess the Catholic religion, the exercises of religious worship are Catholic; but members of any religious denomination are received, provided they be willing, for the sake of order and uniformity, to conform respectfully to the religious observances of the University.

The university authorities are convinced that without religion there can be no education in the truest sense of the word, that is to say, no complete and harmonious development of the intellect and heart of man. They hold, furthermore, that religious truth, being definite and certain, may be taught with as much exactness as language or any other branch. Accordingly the study of Christian Doctrine is required of every Catholic student, and two periods weekly are devoted to it in every class of every course. One unit per semester is allowed for this work.

STUDENTS' HEALTH SERVICE

The University exercises supervision over the health of students. Though a certain degree of sickness is inevitable among so many, its percentage is very slight. A physician is in daily attendance at the University without extra charge for minor cases. A certificate of health, either from the home or from the resident physician, is required of each student. Wholesome food, regular hours for rising and retiring, excellent climate and ample opportunity for outdoor recreation, all combine to improve the general health of the students who are registered at Santa Clara.

All students at the time of registration are required to undergo a physical examination under the supervision of the university physicians. Moreover, in accordance with the recommendation of the State Board of Health all students must present a certificate of vaccination or be vaccinated by one of the university physicians.

The University assumes no responsibility for injuries sustained by any student during play, in the swimming tank, in the gymnasium, or during athletic contests.

MILITARY SCIENCE

All undergraduates are required to take the lower division courses in military training unless exempted by the Professor of Military Science and Tactics. For this purpose all students at the time of entrance must report to the proper officers for assignments in military science.

Exemptions from military training are granted in the following cases:

1. Students who are twenty-one years of age when they first register at the University. Claims for this exemption MUST be accompanied by an affidavit from a parent or guardian.
2. Students unable to drill by reason of physical disability, as certified to by the University Physician.
3. Students whose military work elsewhere is accepted by the Professor of Military Science and Tactics as fulfilling the requirements.
4. Students who hold a commission or a Certificate of Capacity for a commission in the Army of the United States, Naval or Marine Corps Reserve.
5. Non-citizens of the United States.
6. Students entering the University after having attended another institution of like standing for a period of two years or more.

Students exempted from Military Science, in order to receive a degree must offer an equal number of units of other work in lieu of Military Science. Choice of these courses must be approved by the Dean of the college in which the student is registered.

Petitions for exemptions from, or deferment of, military training made by qualified students will not be received except for illness or physical disability occurring after enrollment in the courses. Students who make such petitions must be present at assignments while petitions are pending.

Students who complete the lower division courses and who are selected by the Professor of Military Science and Tactics may elect the upper division courses.

Students who complete the upper division courses, and who participate in such summer camps as the Secretary of War may prescribe, are eligible upon graduation for appointment and commission

by the President in the Officers' Reserve Corps, which in the event of an emergency would furnish a great part of the commissioned personnel required for the temporary forces.

A student, subject to this requirement, who fails to appear for work in the course, will be liable to dismissal from the University Students so dismissed may be reinstated only upon recommendation of the Professor in charge and the approval of the President of the University.

Fees and Deposits

A deposit of $5.00 is required of all first and second year students registered for military science, to protect against loss of Government ordnance and to cover cost of military science text books. An additional sum of $7.00 is charged all first and second year students registered for the first time in military science, to cover cost of military shoes.

Uniforms, except shoes, are issued without charge to all students taking military training. Shoes are furnished at the cost price of approximately $7.00. At the end of the year, or sooner if the student leaves the University, all property except shoes must be returned to the supply room. Any wilful damage to the uniform or equipment must be paid for by the individual student.

DISCIPLINE

Students whose homes are not in the neighborhood must reside within the University unless they are accompanied by their parents.

Students are not permitted to have books or other publications that have not been approved by the Vice-President.

The students' correspondence is subject to the inspection and control of the President.

To hold meetings or to form clubs or societies of any kind without the consent of the President, to gamble, to enter pool rooms, the habitual use of profane language, unbecoming conduct either within or without the precincts of the institution, the possession or distribution of indecent publications or pictures, intoxication, procuring or introducing intoxicating liquors, directly or indirectly, into the University, habitual idleness and violation of the rules of the University, obstinate refusal to submit to a punishment inflicted, absence from the University at night without leave, avowed principles of infidelity, express contempt or ridicule of religion, are offenses which expose the offenders to dismissal or suspension, as in the judgment of the Faculty shall be deemed necessary.

It is strictly forbidden for any student or group of students to haze any other student or subject him to any personal or physical indignity or treat him in such wise as may reasonably give offense.

No student will be permitted to leave the University on visits of any length, except during Christmas and Easter vacations, if such be the wishes of his parents or guardians. Parents are requested not to call their sons home at other times, except in cases of urgent necessity, as such interruptions, besides tending to prevent the acquisition of habits of concentration and persevering work, are apt to result in poor scholarship and interfere seriously with the students' entire scholastic training.

Students who, having left the University for the summer vacation, Christmas holidays, or other recesses allowed by the President, fail to be present on the day for the reopening of class, may, by the

fact of absence, be excluded from the University, or at the discretion of the Faculty from privileges until the following semester, unless parents or guardians show cause of absence which the Faculty shall consider wholly sufficient.

Promptness in reaching the University on the day fixed for the opening of classes is necessary. It is essential that parents and students understand this clearly from the beginning of their connection with the University, as promptness in returning from vacation and recesses, which is requisite in order to prevent the loss of valuable time and the forming of habits of procrastination and negligence of duty, is strictly insisted on. Anyone returning after the date set down for the opening of the fall or spring semester will be required to pay a late registration fee of $2.50 for the first day and $1.00 for each day thereafter. Registration is not completed until a student has attended classes.

The University reserves the right to dismiss at any time a student who fails to give satisfactory evidence of earnestness of purpose and of interest, primarily in the serious work of college life. Dismissal may be made without specific charges and, in rare cases, perhaps on grounds that seem insufficient to students and parents. The University in these cases holds itself to be the more capable judge of what affects the interests of the institution and the student body.

Eligibility Rules

Except where otherwise specifically provided for by the Faculty, students taking part in public debates, oratorical or dramatic art contests or representing any department of the University in intercollegiate athletic events, as well as all those who are appointed on the staff of the university publications or as officers of student organizations, or are elected as captains or officers of any society, are subject, at the time of their selection or appointment, to the following eligibility rules: (1) They must have no conditions or failures; (2) They must have attained a satisfactory grade in conduct and application during the preceding month and a weighted average of C (77-84) in the last mid-term or semester examinations; (3) They must not be under censure.

Any student admitted to the University on a scholarship or as a student worker who fails to obtain a semester average of C (77-84) in any of his subjects forfeits his right to his position or scholarship.

The registration of a student is deemed a recognition on his part and on the part of his parents or guardians of compliance with all the rules and regulations of the University, and acceptance of all conditions laid down in the catalogue.

Registration Card

Before registering for instruction in any department, the student must obtain a card signed by the Treasurer of the University, showing that a satisfactory settlement of his account has been made. This card is handed to the Director of Studies, from whom the student must obtain another blank, write thereon the subjects elected and approved, and present it to his professors for their signature. This registration card is then returned to the Director of Studies, to be filed in his office.

SCHOLARSHIP

No student is eligible to enter any examination, written or oral,

nor is he entitled to credit, unless he has been in attendance at 85 per cent of his classes, but students in the College of Law must have been present at 90 per cent of the classes. Absence caused by sickness will not excuse a student from the operation of this rule.

Written Examinations

Written examinations are held every six weeks in all subjects and in all departments. They are also held twice a year upon the work done during the preceding semester.

Oral Examinations

At the end of the scholastic year:

1. All students, regular or special, who have followed the courses in Philosophy, or any part thereof, in the upper division will be examined therein.
2. At the discretion of the Faculty, students of the College of Arts and Sciences may be required to pass an oral examination in their major subject.
3. Upper Division students in the College of Business Administration will be examined in their major subjects.

No student will be orally examined unless he has passed satisfactorily all the written examinations given at the end of each semester on the matter therein, or having been conditioned in the first semester examination, has removed the condition. The examination must extend to all work done during both semesters in the subjects indicated. The examination is to be conducted privately before a board of the Faculty who may increase the time allotted to any examination if they see fit. It does not determine the grade of a student's standing, but neither promotion nor credit is given without a successful examination.

General Requirements

In order to be accepted in fulfillment of any requirement for a degree, all work must be completed with grade D (70-76) or over, and the general average of the work must be of grade C (77-84) or above.

The grade of work completed during the semester is computed as follows (all work being marked on the basis of 100% for perfect work):

For each mid-term grade, class-work counts two-thirds and the mid-term examination one-third;

For each semester grade, the average of the three mid-term grades counts two-thirds and the semester examination one-third.

Where an oral examination is required, the student will not be graduated unless he attains therein a passing grade of D (70-76).

Special regulations as to the grades to be maintained by law students and candidates for degrees and certificates will be found under "College of Law, Graduation."

Amount of Work

In order to receive a degree, a student is required to complete the requisite number of semester hours and secure an equal number of credit points, i. e., an average rating of C grade or better in all subjects.

A semester hour is the standard for computing the amount of a

student's work. A semester hour is defined as one lecture or recitation one hour in length per week for one semester. Three hours of laboratory work are equivalent to one recitation hour. Two hours of preparation on the part of the student are required for each hour of lecture or recitation.

Regular work for Freshmen is sixteen hours per week. For all others it may be from fifteen to eighteen hours. Candidates for a degree will not be allowed to register for fewer than twelve hours of work.

No Freshman may register for more than sixteen credit hours (except in the College of Engineering) without special permission from the Dean of the Faculties, and such registration is not allowed to any student in his first semester of residence.

In the case of students of longer attendance, the Dean may grant permission to take studies up to eighteen credit hours a week, after the standing of the student in each study of the previous semester is examined and found to be B (85) or over. On the other hand, students carrying more than the normal amount of work who fail to maintain a standard of C (77-84) in all of their courses, may be restricted by the Dean to the normal number of units. Even if, because of the difficulty of making the desirable courses total the exact limit, a student is permitted to carry a study-list slightly greater than the limits here set, or if a student transfers from another college where a greater study-list is permitted or required, the credit towards the degree will be limited strictly according to this rule.

Quality of Work

A student's grade of scholarship is given according to the following schedule:

Above passing:	Below passing:
A (93-100), Excellent	E (60-69), Conditioned
B (85-92), Good	F (0-59), Failed
C (77-84), Fair	I, Incomplete
D (70-76), Passed	W, Withdrawn

Conditions

A grade of E (60-69) at the end of a semester indicates a condition. A student who is conditioned in two subjects may be excluded from the University, but without prejudice to his continuing his studies at another university.

Where a student is conditioned at the end of the semester, he will be permitted to remove the condition at the time set for the examinations for the removal of conditions.

Where a student is conditioned in a written or oral examination, given at the end of the school year, he will not be re-examined until the beginning of the next school year; provided however, that where a student is conditioned in a written or oral examination given as one of the final tests before graduation, he will not be re-examined until six months after receiving the conditions.

Where a student has been re-examined in any subject to remove a condition or reach a certain average, another examination may be permitted in the discretion of the Faculty; but in no case may it be

taken until two months have elapsed since the former examination. If the student fails to reach the required average no further examination will be allowed.

Any student who enters his Senior year with a condition will have the status of a special student unless this condition is removed within one month after the opening of the first semester.

Failures

A grade of F (0-59) at the close of a semester indicates a failure. A failure in a subject means that the student must repeat the work in class the next time it is given. A student who fails in two subjects may be excluded from the University.

A conditioned student who fails to pass a satisfactory examination at the time set for condition examinations receives a failure in the subject, unless, on recommendation of his professor, the Faculty shall permit him to review a subject in which he is thus deficient with the assistance of an acceptable private tutor; in which case he will be excused from attending the recitations, but will be required to take the regular examination at the end of the year or half-year.

If the condition is received in a laboratory course, the student must make up the work in which he is deficient before the time of the condition examinations or receive a failure.

Credit Points

A candidate for a degree must gain not only the number of credit hours required, but his work must reach a certain standard of excellence. In addition to the required number of credit hours necessary for graduation, each student must earn an equal number of credit points, or an average mark in all subjects of C or better.

For a grade of A in a given course a student will receive three times as many credit points as there are credit hours in that course; for a grade of B, twice as many credit points; for a grade of C, as many credit points as credit hours; while D gives credit hours but no points. For every failure at the end of the semester, one credit point per credit hour is to be deducted from the total number of credit points that could otherwise be gained. Such lost points cannot be made up by repeating the course, even though the credit hour in such cases will count towards the total number of credit hours required for graduation.

For example: A four hour course in which the student receives the grade of A gives 12 credit points; if the grade is B, 8 credit points; if C, 4 credit points; if D, no credit points. If the grade is F, four credit points are deducted.

Thus, in a course where 128 credit hours are required for graduation, the maximum number of credit points that can be secured by a student is 384; the minimum, 128.

Candidates for graduation must attend any course of lectures or any other exercises that have been or may be authorized and equipped by the Faculty, even though such courses receive no value in credits.

No student will be advanced to full junior standing who has less than 64 credit hours and 64 credit points by the end of his sophomore year.

Electing Studies

All students must inform the Director of Studies in writing as to their choice of subjects, and no one may enter upon a course or relinquish one already taken up without his advice and consent, upon penalty of receiving no credit in the first case, and a condition in the subject abandoned, in the second.

Candidacy for Degree or Certificate

Every student who wishes to become a candidate for a degree or certificate in any department of the University must, not later than one month after his entrance, file with the Dean of the Faculties a written statement of the degree or certificate to which he aspires and the work which he proposes to do. He will then be informed whether he may be admitted as a candidate for such degree or certificate and whether the work proposed is satisfactory. Any change of purpose must be similarly announced and approved.

Thesis

Candidates for a degree must submit a thesis on their major or some cognate subject. The thesis shall consist of not fewer than 5000 words and shall be typewritten on National White unruled paper 8½x11 inches. The subject must be submitted to the Dean of the Faculties for approval not later than October 30 and the thesis itself handed in completed on February 15 of that same year. The presentation of an acceptable thesis is an absolute prerequisite for admission to final examination. The ultimate decision as to whether the effort merits the certificate or degree rests with the Committee on Theses.

COURSES, UNITS

Courses in the University are divided into three groups: The Lower Division, comprising the studies in the freshman and sophomore years; the Upper Division, comprising the studies in the junior and senior years, and leading to the Bachelor's degree; and Graduate Courses, comprising graduate studies, and leading to advanced degrees.

Courses in the Lower Division are numbered from 1 to 100. Courses in the Upper Division are numbered from 101 to 200. Courses for Graduate students are numbered from 201 up. Under certain conditions Lower Division courses may be taken for Upper Division credit, but in such cases it is expected that a higher standard of work shall be done and the instructor will assign additional work for such students. Upper Division subjects may be taken for Graduate credit under such conditions as may be prescribed by the Dean of the Faculties and the professor in charge.

RECOMMENDATIONS TO OTHER SCHOOLS

No student will be recommended for entrance into any other university or college who has not maintained an average of B (85-92) in every subject throughout his course.

Students wishing Transcripts of Record in order to transfer to another school or for any other purpose should make early and seasonable application for the same. No such statements will be made out during the busy periods of examination and registration. Credentials which are accepted for admission become the property of the University and are kept permanently on file.

SESSIONS

The first semester begins in September and ends about the end of January.

The second semester begins in February and ends about the third week of June.

As in most departments of the University new courses are not begun in February, students desiring to matriculate at the beginning of the second semester can only be received on condition that they are prepared up to the point then reached by the class which they desire to enter.

COLLEGE OF ARTS AND SCIENCES

CURRICULUM

The curriculum of the College of Arts and Sciences extends over a period of four years and comprises courses of study selected with special regard to their cultural value. In addition the courses selected are designed to afford the most solid foundation for the learned professions and the larger commercial pursuits characteristic of the present age. The curriculum selected assumes that the essence of education is concerned with the physical, mental and moral development of the whole man and that specialization in particular fields should rest upon the foundations thus laid. For this reason the curriculum of the College of Arts and Sciences insists on the advantage of a prescribed training in the humanities, rhetoric, mathematics, natural sciences, religion and the various branches of philosophy. Concentrated work in the College of Arts and Sciences is offered under the name of "majors" in the fields of Classical Languages, Economics, English, History, Philosophy, Political Science, Biology and Chemistry.

ENTRANCE REQUIREMENTS

The following are the required high school units necessary for admission to Freshman standing in the College of Arts and Sciences. A total of fifteen units, including the following, is necessary.

	A.B.	Ph.B. & B.S.
English	3	3
Latin*	4	
Greek*	2	
Foreign Language*		2
Algebra	1	1
Geometry	1	1
History	2	2
Laboratory Science	1	1

*Students entering with only two units of Latin for the A.B. course or without two units of foreign language for the other courses, will be given an opportunity to make up these deficient units during the first two years of college. Both units must be in the same language.

It is strongly recommended that the unprescribed units for the Ph.B. or B.S. degrees be in Mathematics, Languages (preferably Latin) or Sciences.

DEGREES

The College of Arts and Sciences confers the degrees of Bachelor of Arts, Bachelor of Philosophy and Bachelor of Science.

The Bachelor of Arts degree is conferred on those students who, presenting at entrance four credits in Latin and two credits in Greek, complete two more years of these languages in college in addition to the other requirements of the major of their choice. Students entering without the prescribed amount of Latin and Greek but who have had at least two years of credit in Latin may be permitted to make up the deficiencies in Latin and Greek during their college course.

The Bachelor of Philosophy degree is conferred on those students who, substituting modern language for Latin and Greek, complete the requirements for the major in Philosophy.

The Bachelor of Science degree is conferred on those students who, substituting modern language for Latin and Greek, complete the requirements for any of the majors offered other than Philosophy.

THE PRE-MEDICAL COURSE

Students entering the College of Arts and Sciences with the purpose of later going on to the study of Medicine satisfy all the requirements prescribed by the Council on Education of the American Medical Association by following the major in Biology. The curriculum is so arranged that the student may comply with the requirements for entrance to Medical schools in three years. However, because the number of medical applicants is growing each year, few medical schools now admit students without a college degree. It is therefore recommended, that Pre-Medical students spend four years in their preparation and add such cultural courses to their schedule as will better fit them to pass with success through the vast field of experiences which await the physician in the practice of his profession.

DIVISIONS OF THE COLLEGE

The college recognizes a lower and an upper division. The work of the lower division comprises the studies of the freshman and sophomore years. The completion of the lower division is a prerequisite for admission to the upper division. For any degree a minimum of 128 units is required, 64 of which the student will normally take in the lower division and 64 in the upper. Each unit represents one hour of the student's time at the University weekly, during one-half year, in lecture or recitation, together with the time necessary in preparation therefor, or a longer time in laboratory or other exercises not requiring preparation.

No student may register for more than sixteen hours (outside of Religion) without special permission of the Faculty, and such registration is not allowed to any student in his first semester of residence. After one semester of regular work, students beyond freshman may receive permission to take not more than eighteen units per semester, provided they have attained a weighted average of at least B (85-92) the preceding semester. On the other hand, students carrying more than the normal amount of work who fail to maintain a standard of C (77-84) in all their courses may be restricted by the Dean to the normal number of units. Even if, because of the difficulty of making the desirable courses total the exact limit, a student is permitted to carry a study-list slightly greater than the limits here set, or if a student transfers from another college where a greater study-list is permitted or required, the credit towards the degree will be limited according to this rule.

LOWER DIVISION

In the lower division it is expected that the student, in addition to fulfilling the prerequisites for the major work upon which he will

concentrate in the upper division, will make an effort to establish a basis for that breadth of culture which will give him a realization of the methods and results of some of the more important types of intellectual endeavor, and a mental perspective that will aid him in reaching sound judgments. The lower division requirements were designed to provide in some measure for the accomplishment of this purpose, without unduly limiting the student's opportunity to satisfy his individual tastes and preferences.

Certain courses taken in the high school are accepted as fulfilling in part or in whole some of these lower division requirements. It is desirable that the student should so arrange his high school program as to reduce the required work in the fields of foreign languages, mathematics and the natural sciences. This makes his program more flexible, gives him greater freedom of choice, and prepares him to pass more quickly into advanced work or into new fields of study. In no case, however, does the satisfaction of lower division requirements in the high school reduce the amount of work required in the lower division or for the degree. The lower division work presupposes the prescribed entrance requirements, the successful completion of Subject "A" and the specified requirements in the respective courses, along with an essay of not less than 5,000 words in the subject prerequisite for the upper division major, as provided in the General Regulations. The presentation of an acceptable essay is an absolute prerequisite for admission to final examinations.

Pre-legal requirements are met by students following the regular courses in the College of Arts and Sciences.

UPPER DIVISION

Only those students who have completed the lower division requirements will be registered as regular students in the upper division.

Degrees in the College of Arts and Sciences will be granted upon the following conditions:

1. The total number of units in college courses in the lower and upper divisions must be at least 128.

2. At least 60 units of upper division subjects must be completed after fulfilling the requirements of the lower division. Where lower division units are taken for upper division credit both the quantity and quality of such work must conform to upper division standards.

3. Candidates for graduation must complete a major of 24 upper division units in either Classical Languages, Philosophy, Economics, English, History, Political Science, Chemistry or Biology.

4. In addition to the units in the major chosen, a minor of 12 units in a specific department must be offered. For those choosing a major other than Philosophy a minor in Philosophy will be prescribed.

5. Candidates for a degree must submit a thesis in their major subject consisting of no fewer than 5000 words, as prescribed in the General Regulations. The presentation of an acceptable thesis is an

absolute prerequisite for admission to final examinations. The ultimate decision as to whether the effort merits the degree rests with the Committee on Theses.

6. Candidates for graduation must moreover pass all prescribed oral examinations provided for in the General Regulations.

7. Residence of at least one year immediately preceding graduation is required for the granting of any degree.

Electives. Courses not taken as prescribed courses and not included in the students' major and minor sequences may be chosen as free electives to complete the 128 units required for graduation.

Additional Units. When the nature of the course permits, students taking a course as a Major or Minor, with the approval of the Dean of Faculties, may arrange to present work for additional credit in such course. Such work shall be done under the direction of the Professor in charge and in both quantity and quality shall conform to the required standard of the course.

Subject Requirements

(a) Prescribed subjects for the A. B. degree:

	Credit Hrs.		Credit Hrs.
English	12	History	6
Latin	12	Metaphysics	12
Greek or a Modern Lang.	12	Ethics	6
Science	8	Religion	8
Public Speaking	2	Logic	6
		Mil. Sc.	6

(b) Prescribed subjects for the B. S. and Ph. B. degrees:

English	12	Logic	6
Modern Language	12	Public Speaking	2
Science	8	Metaphysics	12
		Ethics	6
Religion	8	Mil. Sc.	6

Students who have received the Junior Certificate in other institutions must secure before graduation all the prescribed credits, except those in Science and History. In place of these they may offer such electives as are approved by the Dean of the Faculties.

The prescribed courses in Evidences of Religion will be required only of Catholic students.

COLLEGE OF BUSINESS ADMINISTRATION

GENERAL STATEMENT

The College of Business Adminstration aims to train students to meet the general as well as specific problems of modern industry.

The College offers majors in Accounting, Business Management, and Finance. Additional work is offered in advertising, marketing, labor relations, statistics, insurance, transportation, business law, retailing, personal management, mathematics, and other subjects.

During the first two years of the course, extreme specialization is not the aim of the College. Rather, the student is trained well in the fundamentals of economics, english, accounting, mathematics, and logic, so that upon the selection of his major in his junior year, he will be well prepared and qualified to analyze and study the technical and special problems of business.

The courses in ethics, philosophy and science provide the student with the broader fundamental principles necessary for dealing with the industrial system in its social relationships.

Regardless of the major selected, all students are required to include in their curriculum a sufficient number and diversification of courses to provide a comprehensve preparation for general business problems.

ENTRANCE REQUIREMENTS

The following are the required high school units necessary for admission to Freshman standing in the College of Business Administration. A total of fifteen units, including the following, is necessary.

English	3	Geometry	1
Foreign Language*	2	History	2
Algebra	1	Laboratory Science	1

*Students entering without two units of foreign language will be given an opportunity to make up these deficient units during the first two years of College. Both units must be in the same language.

It is strongly recommended that the unprescribed units be in Mathematics, Sciences, or Languages, in the order named.

Business Lectures

Throughout the year a series of lectures is given by business and public men of prominence on various problems of interest to the student body. These lectures bring the students into personal contact with representative business men and also enable them to become familiar with practical business problems.

Inspection Trips

The close connection of the University with the business and industrial establishments of the San Francisco metropolitan district enables the faculty to arrange various inspection trips to such industries as may be of interest. In this way students are given a practical insight into the business organization and working of representative industries.

Graduation

The curriculum of the College of Business Administration extends over four years and leads to the degree of Bachelor of Commercial Science.

The work in this college is divided into that of lower division and upper division.

Graduation from this college requires the completion of 128

units of college work, of which 64 units constitute the amount required in the lower division of the University, and at least 60 of which are required in upper division. To qualify for a degree a student must maintain at least a C average in the required upper division courses in law and economics.

LOWER DIVISION

The requirements for the lower division in the College of Business Administration are as follows:

1. The successful passing of Subject A, prescribed in all departments of the University.
2. The equivalent of 12 units in one of the following languages: French, Spanish, Italian, or German.

SCHEDULE OF COURSES

Freshman Year

(First Semester)	Units	(Second Semester)	Units
Eng. 1 (English)	3	Eng. 2 (English)	3
Phil. 12 (Gen. Psychology)	3	Phil.9 (Logic)	3
Language	3	Language	3
Science	4	Science	4
Math. 1 (College Algebra)	3	Math. 15 (Analysis)	3
Econ. 11 (Introd. to Business)	1	Econ. 11 (Introd. to Business)	1
Religion 1	1	Religion 2	1
Mil. Sci. 1	1½	Mil. Sci. 2	1½
	19½		19½

Sophomore Year

Phil. 10 (Epistemology)	3	Phil. 11 (Metaphysics)	3
Language	3	Language	3
Econ. 1A (Prin. of Econ.)	3	Econ. 1B (Prin. of Econ.)	3
Econ. 10A (Accounting)	4	Econ. 10B (Accounting)	4
Pub. Spk. 1	1	Pub. Spk. 2	1
Religion 3	1	Religion 4	1
Mil. Sci. 3	1½	Mil. Sci. 4	1½
	16½		16½

UPPER DIVISION

Courses offered in the upper division are designed to permit specialization in one of the three major fields listed below. Each student is required to select one of these majors upon entering the upper division.

Accounting: For those who wish to follow the accounting profession either with public accounting firms or in private industry. Upon the completion of this major, the graduate is prepared to take the examination for Certified Public Accountant.

Suggested Program for a Major in Accounting

Junior Year

(First Semester)	Units	(Second Semester)	Units
Phil. 101 (Phil. of Mind)	3	Phil. 102 (Phil. of Theism)	3
Econ. 140 (Math. prin. of Finance)	3	Econ. 100 (Prin. of Statistical Meth.)	4
Law 1	2	Law 2 (Negotiable Instr.)	2
Religion 101	1	Religion 102	1
Econ. 130 (Accounting Valuation)	3	Econ. 131 (Acct. Proprietor	3
Elective	1	Econ. 135 (Anal. of Financial Statements)	3
Econ. 133 (Cost Accounting	3		
	16		16

Senior Year

Phil. 103 (Fund. Ethics)	3	Phil. 104 (Applied Ethics)	3
Law 3	3	Law 4	3
Religon 103	1	Religion 104	1
Econ. 132 (Accounting Problems)	3	Econ. 132 (Accounting Problems)	3
Econ. 134 (Accounting Systems)	3	Econ. 138 (Income Taxation)	3
Elective	3	Elective	3
	16		16

Business Management: This major is designed for students who desire to prepare for a career in marketing, management, merchandising, advertising, selling, or market research work.

Suggested Program for a Major in Business Management

Junior Year

(First Semester)	Units	(Second Semester)	Units
Phil. 101 (Phil. of Mind)	3	Phil. 102 (Phil. of Theism)	3
Econ. 140 (Math. Principles of Finance)	3	Econ. 100 (Prin. of Statistical Methods)	4
Law 1	2	Law 2	2
Religion 101	1	Religion 102	1
Econ. 181 (Prin. of Marktg.	3	Econ. 184 (Advertising)	3
Econ. 133 (Cost Accounting	3	Econ. (Elective)	3
Elective	1		
	16		16

Senior Year

Phil. 103 (Funda. Ethics)	3	Phil. 104 (Applied Ethics)	3
Law 3	3	Law 4	3
Religion 103	1	Religion 104	1
Econ. 160 (Bus Mgt.)	3	Econ. 166 (Ind. Personnel Management)	3
Econ. 165 (Retailing)	3	Econ. 182 (Mkt. Problems)	3
Elective	3	Elective	3
	16		16

Finance: This major is for those students who are planning to enter banking, insurance, invesmtent, or brokerage professions.

Suggested Program for a Major in Finance

Junior Year

(First Semester)	Units	(Second Semester)	Units
Phil. 101 (Phil. of Mind)	3	Phil. 102 (Phil. of Theism)	3
Econ. 140 (Math. Principles of Finance)	3	Econ. 100 (Prin. of Statistical Methods)	4
Law 1	2	Law 2	2
Religion 101	1	Religion 102	1
Econ. 121 (Corp. Finance)	3	Econ. 120 (Public Finance & Taxation)	3
Econ. 122 (Money and Banking)	3	Econ. 135 (Analysis of Financial Statements)	3
Elective	1		
	16		16

Senior Year

Phil. 103 (Fund. Ethics)	3	Phil. 104 (Applied Ethics)	3
Law 3	3	Law 4	3
Religion 103	1	Religion 104	1
Econ. 160 (Bus Management)	3	Econ. 125 (Sp. Studies in Corp. Finance)	3
Econ. 124 (Investments and Invest. Institutions)	3	Econ. (Elective)	3
Elective	3	Elective	3
	16		16

COLLEGE OF ENGINEERING

INTRODUCTION

COLLEGE OF ENGINEERING

The College of Engineering in the University of Santa Clara was founded to give young men, ambitious to follow the profession of engineering, an opportunity to prepare for their profession in an environment and atmosphere conducive to deep, persevering study and to cultural and moral development.

To meet this demand, the Faculty of the University added sound and thorough courses in Civil, Electrical and Mechanical Engineering. As in all other departments of the University, the students are under the moral guidance of the Jesuit Fathers. The technical work of these departments is in the hands of experienced and practical engineers who devote their whole time and attention to the success of their work. As is traditional at Santa Clara, students in Engineering are given individual care, assistance, advice and encouragement. The work exacted is of the highest type; nevertheless, owing to this individual care and to the judicious admission of students as well as to the prompt elimination from the various departments of students found to be inadequately prepared in fundamental studies or in seriousness of purpose, there is very little likelihood and no excuse for failure on the part of the student.

The engineer today must be more than a machinist, electrician or surveyor. He can no longer be a self-made man in the old sense. He must possess the acumen and culture which only a broad college training and college association can give, and his acquaintance with and love of mathematics and science should be the foundation on which his knowledge of their technical application is based.

This is the ideal which Santa Clara cherishes for the engineers who shall receive their education from her, and the notable work which her graduates are doing proves that this ideal leads to success.

ENTRANCE REQUIREMENTS

The following are the required high school units necessary for admission to Freshman standing in the College of Engineering. A total of fifteen units, including the following, is necessary.

English	3	Geometry	1½
Foreign Language	2	History	1
Algebra	1½	Laboratory Science	1

It is strongly recommended that the unprescribed units be in Mathematics, Languages or Sciences.

COURSES--DEGREES

Courses are offered leading to the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering and Bachelor of Mechanical Engineering. These courses aim, first, to give the student a thorough knowledge of the sciences on which all Engineering is based; second, to develop practical judgment so that he may be able to use his knowledge and information to best advantage.

The curricula in the College of Engineering are arranged according to two plans, respectively called the Four Year Plan and the Five Year Plan. Technical course content and requirements for graduation are the same in both plans. The required work prepares the student

for accepting and discharging the responsibilities of his chosen profession. The Five Year Plan; (1) distributes the required work over a longer period, and (2) permits election of added cultural and technical courses for which no time is allowed in the Four Year Plan. A Five Year Plan student, free from deficiencies in University work, may register for 18 units of new work. Upon approval by the Dean of the College of Engineering, change can be made at any time from the Four Year Plan to the Five Year Plan. The change from the Five Year Plan to the Four Year Plan cannot be effected without transfer of sufficient credits to meet the schedule in the latter plan.

Civil Engineering relates to works in connection with transportation, such as highways, railways and canals; to structural works, such as bridges, buildings, dams, piers and many other structures constructed in wood, steel or reinforced concrete; to sanitary works and works which have to do with water, such as the collection, purification and distribution of water for a municipal supply; the collection, treatment and disposal of sewage; the drainage of some lands and the irrigation of others. In all of these fields of work technical, knowledge is required for the execution of successful designs, and for their proper operation and maintenance.

All Civil Engineering students are required to attend a four-weeks summer session in surveying immediately following the close of their sophomore year. This work fulfills the requirements of one of the summers that must be spent on engineering work.

Electrical Engineering is a profession of widespread application. In spite of this diversity the basic principles apply equally to the generation, transmission and utilization of electrical energy for heating, mechanical power, illumination, wire and rado communication, electronic control, measurements, navigational aids, etc. At Santa Clara the underlying preparation in mathematics, physics, chemistry, mechanics, thermodynamics, and drawing is given in the first three fourths of the scheduled program. This preparation is common to Mechanical and Electrical Engineering so the courses are largely the same. In the remaining fourth of the program the fundamental principles are applied to vacuum tube circuits, transmission lines, rotating machinery, etc., to formulate working rules, explain operating behavior and establish and apply economic and technical design criteria. The aim is always to develop the student's ability to apply the fundamental principles. In the final semester the application studies are continued in power or communications according to the option chosen.

Mechanical Engineering may be divided into three closely related lines, Design, Management and Power Generation. The courses in Design begin with mechanical drawing and continue with a study of mechanisms, strength of materials, stresses, vibration, adaptability, ease of manufacture, cost, and commercial worth of machines. Management has to do with the organization of commercial enterprise, systems of works management, efficiency systems, engineering economics, cost of materials and power, and layout of machinery in a factory for maximum output. The subject of Power Generation is covered by courses on steam and internal combustion engines, turbines, boilers, water motors and electrical generators, together with the proper operation of all classes of machinery and the application of power to them.

GRADUATE DEGREES

For the degrees of Civil Engineer (C.E.), Electrical Engineer (E.E.), and Mechanical Engineer (M. E.), it is required that the candidate be a graduate of the College of Engineering of this University who has been engaged in acceptable professional work for a period of not less than three years after receiving the Bachelor's degree. Candidates for these degrees must declare their candidacy and file with the Dean of the College of Engineering a detailed statement covering their professional study and experience and an outline of their proposed thesis not later than December 31st preceding the commencement at which they wish to receive the degree, and they must submit the completed thesis not later than one month prior to the date fixed for the annual conferring of degrees.

INSPECTION TRIPS

One important advantage of the University is its proximity to the many industrial establishments of the San Francisco metropolitan district and this opportunity is taken advantage of by inspection trips to special industries. In this way students are given a practical insight into the operation of these engineering industries.

STUDENT BRANCHES:
AMERICAN SOCIETY OF CIVIL ENGINEERS
AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS
AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Student Branches of the A.S.M.E., A.I.E.E. and A.S.C.E. have been established at the University, and are open to students of Mechanical Electrical and Civil Engineering for the discussion of current problems.

REQUIREMENTS FOR GRADUATION

In all curricula of the College of Engineering, 135 credits are required for graduation. A credit is gvein for each one-hour recitation or lecture, per week, carried satisfactorily for one semester or for three hours per week spent in laboratory, drawing room or shop. All regular students free from deficiencies in university work may register for 18 units of new work.

At least two summer vacations must be spent on engineering work before graduation. A detailed report of this work must be handed to the Dean of the College of Engineering within one month of the openinig of the first semester of the Senior year.

Before anyone is admitted to the final examinations of the second semester of the Senior year, he must submit a thesis on a subject chosen by the student, with the approval of the Dean of the College of Engineering. It must deal with an engineering subject and must give evidence of original investigation of some engineering problem. It must consist of no fewer than 5000 words and should be typewritten on paper 8½ x 11 inches. The ultimate decision as to whether the thesis is of sufficient merit to fulfill the requirements rests with the Committee on Theses.

Residence of at least one year immediately preceding graduation is required for the granting of any degree.

Note: One period each week in Mathematics 31, 32, 33 and 34 is devoted to review and discussion for which the student is not required to prepare an assignment or home work.

CIVIL ENGINEERING

FOUR YEAR PLAN

Freshman Year

(First Semester)	R	L	U
Math 31 (Introductory Analysis)	5		4
Engl. 11 (Composition)	3		3
Chem. 7 (General Chem.)	2	6	4
G.E. 1 (Engineering Drawing)		6	2
G. E. 3 (Orientation)	1		½
M.E. 11 (Shop)		3	1
Mil. Sci. 1	1	2	1½
Religion 1	2		½
	14	17	16 1/2

(Second Semester)	R	L	U
Math 32 (Introductory Analysis)	5		4
Engl. 12 (Composition)	3		3
Chem. 8 (General Chem.)	2	6	4
G.E. 2 (Engineering Drawing)		6	2
G. E. 4 (Orientation)	1		½
C.E. 6 (Surveying)	2		2
Mil. Sci. 2	1	2	1½
Religion 2	2		½
	16	14	17½

Sophomore Year

Math. 33 (Calculus)	5		4
Physics 12	3		3
Physics 13		6	2
G.E. 15 (Mechanics-Statics)	3		3
C.E. 7 (Surveying)	1		1
C.E. 57 (Survey Practice)		6	2
Mil. Sci. 3	1	2	1½
Religion 3	2		½
	15	14	17

Math. 34 (Calculus)	5		4
Physics 14	3		3
Physics 15		6	2
G. E. 16 (Mechanics Materials)	4		4
G. E. 66 (Materials Lab.)		3	1
C.E. 58 (Survey Practice)		3	1
Mil. Sci. 4	1	2	1½
Religion 4	2		½
	15	14	17

C.E. 8 Summer School of Surveying following the Sophomore Year ..... 4 Units

Junior Year

G.E. 115 (Mechanics-Dynamics)	2		2
G.E. 165 (Dynamics Lab.)		3	1
G.E. 117 (Materials and Processes)	2		2
E.E. 135 (Elect. Engr.)	3		3
E.E. 185 (Elect. Lab.)		3	1
Geol. 101 (Engr. Geology)	2	3	5
C.E. 121 (Graphics	1		1
C.E. 171 (Graphics Problems)		6	2
Philosophy 31	3		1½
Religion 101	2		½
	15	15	17

G.E. 116 (Mechanics-Fluids)	2		2
G.E. 166 (Fluids Lab.)		3	1
Engl. 114 (Tech. English)	2		2
M.E. 130 (Heat Power)	3		3
M.E. 180 (M. E. Lab.)		3	1
C.E. 122 (Structures)	4		4
C.E. 172 (Structural Design)		6	2
Philosophy 32	3		1½
Religion 102	2		½
	16	12	17

Senior Year

First Semester	R	L	U
C.E. 131 (Sanitary Engr.)	3		3
C.E. 181 (Sanitory Lab.)		3	1
C.E. 123 (Structures)	2		2
C.E. 173 (Structural Design)		6	2
G.E. 121 (Engr. Econ.)	3		3
Public Speaking 1	1		1
Philosophy 33	3		1½
Religion 103	2		½
Options	2	3	3
	16	12	17

Second Semester	R	L	U
C.E. 142 (Transportation)	2		2
C.E. 192 (Transportation Lab.)		3	1
C.E. 124 (Rienforced Concrete)	4		4
C.E. 174 (Structural Design)		3	1
Law 91	1		1
G.E. 108 (Seminar)	1		1
C.E. 170 (Thesis)		6	2
Philosophy 34	3		1½
Religion 104	2		½
Options	2	3	3
	15	15	17

OPTIONS IN CIVIL ENGINEERING
TRANSPORTATION

First Semester	R	L	U	Second Semester	R	L	U
C.E. 109 (Route Surveying)	2		2	C.E. 144 (Transportation Engr.)	2		2
C.E. 159 (Survey Practice)		3	1	C.E. 194 (Transportation Lab.		3	1
	2	3	3		2	3	3

STRUCTURAL

C.E. 125 (Structures)	2		2	C.E. 126 (Soil Mechanics)	2		2
C.E. 175 (Structural Design)		3	1	C.E. 176 (Soils Lab.)		3	1
	2	3	3		2	3	3

SANITARY

C.E. 133 (Sanitary Engr.)	2		2	C.E. 134 (Sanitary Engr.)	2		2
C.E. 183 (Sanitary Design)		3	1	C.E. 184 (Sanitary Lab.)		3	1
	2	3	3		2	3	3

CIVIL ENGINEERING
FIVE YEAR PLAN

Freshman Year

Math. 31 (Engineering Math.)	5		4	Math. 32 (Engineering Math.)	5		4
Engl. 11 (Composition)	3		3	Engl. 12 (Composition)	3		3
G. E. 1 (Engineering Drawing)		6	2	G.E. 2 (Engineering Drawing)		6	2
G. E. 3 (Orientation)	1		½	G. E. 4 (Orientation)	1		½
M.E. 11 (Shop)		3	1	C.E. 6 (Surveying)	2		2
Mil. Sci. 1	1	2	1½	Mil. Sci. 2	1	2	1½
Religion 1	2		½	Religion 2	2		½
	12	11	12½		14	8	13½

Sophomore Year

Math. 33 (Calculus)	5		4	Math. 34 (Calculus)	5		4
Chem. 7 (General Chem.)	2	6	4	Chem.8 (General Chem.)	2	6	4
C.E. 7 (Surveying)	1		1	C.E. 58 (Survey Practice)		3	1
C.E. 57 (Survey Practice)		6	2	Law 91	1		1
Mil. Sci. 3	1	2	1½	Mil. Sci. 4	1	2	1½
Religion 3	2		½	Religion 4	2		½
	11	14	13		11	11	12

C.E. 8 Summer School of Surveying following the Sophomore Year .....4 Units

Junior Year

G.E. 15 (Mechanics-Statics)	3		3	G.E. 16 (Mechanics of Materials)	4		4
Physics 12	3		3	G.E. 66 (Materials Lab.)		3	1
Physics 13		6	2	Physics 14	3		3
G.E. 117 (Engr. Materials)	2		2	Physics 15		6	2
Geol. 101 (Engr. Geology)	2	3	3	Engl. 114 (Tech. English)	2		2
Philosophy 31	3		1½	Philosophy 32	3		1½
Religion 101	2		½	Religion 102	2		½
	15	9	15		14	9	14

Sub-Senior Year

G.E. 115 (Mechanics Dynamics)	2		2	G.E. 116 (Mechanics-Fluids	2		2
G.E. 165 (Dynamics Lab.)		3	1	G.E. 166 (Fluids Lab.		3	1
E.E. 117 (Elect. Engr.)	3		3	M.E. 130 (Heat Power)	3		3
E.E. 185 (Elect. Lab.)		3	1	M.E. 180 (M.E. Lab.)		3	1
C.E. 121 (Graphics)	1		1	C.E. 122 (Structures)	4		4
C.E. 171 (Graphic Problems)		6	2	C.E. 172 (Structural Design)		6	2
G.E. 211 (Engr. Econ.)	3		3	Philosophy 34	3		1½
Philosophy 33	3		½	Religion 104	2		½
Religion 103	2		½				
	14	12	15		14	12	15

Senior Year

First Semester	R	L	U
C.E. 131 (Sanitary Engr)	3		3
C.E. 181 (Sanitary Lab.)		3	1
C.E. 123 (Structures)	2		2
C.E. 173 (Structural Design)		6	2
Econ. 10A (Accounting)	3	3	4
Public Speaking 1	1		1
Options	2	3	3
	11	15	16

Second Semester	R	L	U
C.E. 142 (Transportation)	2		2
C.E. 192 (Transportation Lab.)		3	1
C.E. 124 (Rienforced Concrete)	4		4
C.E. 174 (Structural Design)		3	1
G.E. 108 (Seminar)	1		1
C.E. 170 (Thesis)		6	2
Options	2	3	3
	9	15	14

Options the same as for four year plan.

ELECTRICAL AND MECHANICAL ENGINEERING

FOUR YEAR PLAN

Freshman Year

Same as Civil Engineering except that one unit of shop is substituted for Surveying in the second semester.

Sophomore Year

Math 33 (Calculus)	5		4
Physics 12	3		3
Physics 13		6	2
G.E. 15 (Mechanics-Statics)	3		3
M.E. 15 (M.E. Lab)	1	3	2
Public Speaking 1	1		1
Mil. Sci. 3	1	2	1½
Religion 3	2		½
	16	11	17

Math 34 Calculus)	5		4
Physics 14	3		3
Physics 15		6	2
G.E. 15 (Mechanics-Materials)	4		4
M.E. 16 (Machine Drawing)		3	1
G.E. 66 (Materials Lab.)		3	1
Mil. Sci. 4	1	2	1½
Religion 4	2		½
	15	14	17

Junior Year

G.E. 115 (Mechanics-Dynamics)	2		2
G.E. 165 (Mechanics Lab)		3	1
G.E. 117 (Materials and Processes)	2		2
E.E. 125 Elect. Circuits)	3		3
E.E. 175 (Elect. Circuits Lab)		3	1
M.E. 125 (Heat Power)	3		3
M.E. 175 (M.E. Lab)		3	1
M.E. 191 (Mach. Design)		6	2
Philosophy 31	3		1½
Religion 101	2		½
	15	15	17

G.E. 116 (Mechanics-Fluids)	2		2
G.E. 166 (Fluids Lab)		3	1
Engl. 114 Technical Engl.)	2		2
E.E. 126 (Elect. Machines)	3		3
E.E. 176 Elect. Mach. Lab)		3	1
M.E. 126 Heat Power)	3		3
M.E. 176 (M.E. Lab)		3	1
Phys. 104 (Elect. Measur.)	1	3	2
Philosophy 32	3		1½
Religion 102	2		½
	16	12	17

Senior Year

G.E. 121 (Engr. Economics)	3		3
Math 116 (Diff. Equations)	2		2
E.E. 127 (Adv. Elect.Cir. Mach.)	3		3
E.E. 177 (Adv. Cir. & Mach. Lab)		3	1
E.E. 131 (Basic Electronics)	3		3
E.E. 181 (Electronics Lab)		3	1
E.E. 171 (Elect. Design)		6	2
Philosophy 33	3		1½
Religion 103	2		½
	16	12	17

G.E. 108 (Seminar)	1		1
Law 91	1		1
E.E. 170 (Thesis)			2
Philosophy 34	3		1½
Religion 104	2		½
Option			7
Technical Electives			4
			17

POWER OPTION

E.E. 128 (Adv. A-C Mach.)	4		4
E.E. 178 (Adv. A-C Mach. Lab)		3	1
E.E. 172 (Power Gen. & Distribution Probs.)		6	2
	4	9	7

COMMUNICATIONS OPTION

E.E. 132 (Adv. Elect. Lab.)		3	1
E.E. 182 (Communications Circuits)	3		3
E.E. 138 (Adv. Electronics)	3		3
	6	3	7

Junior Year

First Semester	R	L	U	Second Semester	R	L	U
G. E. 115 (Mechanics-Dynamics)	2		2	G. E. 116 (Mechanics-Fluids	2		2
G. E. 165 (Dynamics-Lab)		3	1	G. E. 166 (Fluids Lab)		3	1
G. E.117 (Materials and Processes	2		2	Engl. 114 (Tech. English)	2		2
E. E. 125 (Elec. & Mag. Cir.)	3		3	E. E. 126 (Elect Mach.)	3		3
E. E. 175 (Elect Lab.)		3	1	E. E. 176 (Elect. Lab)		3	1
M. E. 125 (Heat Power)	3		3	M. E. 126 (Heat Power)	3		3
M. E. 175 (M. E. Lab)		3	1	M. E. 176 (M.E. Lab)		3	1
M. E. 191 (Mach. Design)		6	2	M. E. 192 (Mach. Design)		6	2
Philosophy 31		3	1½	Philosophy 32	3		1½
Religion 101		2	½	Philosophy 102	2		½
	15	15	17		15	15	17

See note under Industrial Engineering Option

Senior Year

G.E. 121 (Engr. Econ.)	3		3	G. E. 108 (Seminar)	1		1
Math. 116 (Diff. Equat.)	2		2	Law 91	1		1
M.E. 139 (Mech. Vibrations)	1		1	M.E. 138 (Production Contl.)	3		3
M.E. 189 (Vibrations Lab.)		3	1	M. E. 170 (Thesis)		6	2
Philosophy 33	3		1½	Philosophy 34	3		1½
Religion 103	2		½	Religion 103	2		½
Options	5	9	8	Options	5	9	8
	16	12	17		15	15	17

OPTIONS IN MECHANICAL ENGINEERING

AERONAUTICAL

M. E. 135 (Inter. Comb. Engines)	3		3	M. E. 136 (Inter. Comb. Engines)	3		3
M. E. 185 (Int. Com. Eng. Lab.)		6	2	M. E. 186 (Int. Com. Eng. Lab.)		6	2
M. E. 133 (Aerodynamics)	2		2	M. E. 134 (Airplane Struct.)	2		2
M. E. 183 (Aerodynamics Lab.)		3	1	M. E. 184 (Airplane Lab.)		3	1
	5	9	8		5	9	8

AIR CONDITIONING

M. E. 127 (Heat Power)	2		2	M. E. 128 (Heat Power)	2		2
M. E. 177 (M. E. Lab.)		6	2	M. E. 178 (M. E. Lab.)		6	2
M. E. 131 (Heating, Ventilation and Air Conditioning)	3		3	M. E. 132 (Heating, Ventilation and Air Conditioning)	3		3
M. E. 181 (Heat Trans. Lab.)		3	1	M. E. 182 (Heat Trans. Lab.)		3	1
	5	9	8		5	9	8

HEAT POWER

M. E. 127 (Heat Power)	2		2	M. E. 194 (Power Plant Design)	2	3	3
M. E. 177 (M. E. Lab.)		6	1	M. E. 136 (Inter. Comb. Engines)	3		3
M. E. 211 (Inter. Comb. Engines)	3		3	M. E. 186 (Int. Com. Eng. Lab.)		6	2
M. E. 261 (Int. Com. Eng. Lab.)		3	2				
	5	9	8		5	9	8

INDUSTRIAL ENGINEERING

Econ. 133 (Cost Accounting)	3		4	Econ. 100 (Statistics)	3	3	4
M.E. 137 (Time Study & Job Analysis)	2		2	Econ. 136 (Ind. Cost Analysis)	3		3
M. E. 187 (Time Study Lab.)		6	2	M. E. 188 (Production Lab.)		3	1
	5	6	8		6	6	8

NOTE: Students who intend to choose the Industrial Engineering Option should make the following substitutions in the Junior Year of their course: (Econ. 10A, 10B; E. E. 211, 261; M. E. 211, 261) for (E. E. 201, 202, 251, 252; M. E. 201, 202, 251, 252).

FIVE YEAR PLAN

Freshman Year

First Semester	R	L	U	Second Semester	R	L	U
Math 31 (Introductory Analysis (	5		4	Math 32 (Introductory Analysis)	5		4
Engl. 11 (Composition)	3		3	Engl. 12 (Composition)	3		3
G.E. 1 (Engr. Drawing)		6	2	G.E. 2 (Engr. Drawing)		6	2
G. E. 3 (Orientation)	1		½	G. E. 4 (Orientation)	1		½
M.E. 11 (Shop)		3	1	M.E. 12 (Shop)		3	1
Mil. Sci. 1	1	2	1½	Mil. Sci. 2	1	2	1½
Religion 1	2		½	Religion 2	2		½
	12	11	12½		12	11	12½

Sophomore Year

Math 33 (Calculus)	5		4	Math 34 (Calculus)	5		4
Chem. 7 (General Chem.)	2	6	4	Chem. 8 (General Chem.)	2	6	4
Econ 10A (Accounting)	3	3	4	Econ 10B (Accounting)	3	3	4
Mil. Sci. 3	1	2	1½	Mil. Sci. 4	1	2	1½
Religion 3	2		½	Religion	2		½
	12	11	14		12	11	14

Junior Year

G. E. 15 (Mech.-Statics)	3		3	G.E. 16 (Mech. of Mater)	4		4
G.E. 117 (Engr. Mater.)	2		2	G. E. 66 (Materials Lab.)		3	1
Physics 12 (General Phys.)	3		3	Physics 14 (General Phys.)	3		3
Physics 13 (Physics Lab)		6	2	Physics 15 (Physics Lab)		6	2
M.E. 15 (M.E. Lab)	1	3	2	M.E. 16 (Mach. Drawing)		3	1
Public Speaking 1	1		1	Engl. 114 (Tech. English)	2		2
Philosophy 31	3		1 1/2	Philosophy 32	3		1½
Religion 101	2		1/2	Religion 102	2		½
	15	9	15		14	12	15

Sub-Senior Year

G.E. 115 (Mechanics-Dynamics)	2		2	G.E. 116 (Mech-Fluids)	2		2
G.E. 165 (Mechanics Lab)		3	1	G.E. 166 (Fluids Lab)		3	1
E.E. 125 (Elect & Mag. Cir.)	3		3	E.E. 126 (Elect. Machs.)	3		3
E.E. 175 (Elect. Circuits Lab)		3	1	E.E. 176 (Elect. Mach. Lab)		3	1
M.E. 125 (Heat Power)	3		3	M.E. 126 (Heat Power)	3		3
M.E. 175. (M.E. Lab)		3	1	M.E. 176 (M.E. Lab)		3	1
M.E. 187 (Mach. Design)		6	2	Phys. 104 (Elect. Meas.)	1	3	2
Philosophy 33	3		1 1/2	Philosophy 34	3		1 1/2
Religion 103	2		1/2	Religion 104	2		½
	13	15	15		14	12	15

Senior Year

Same as four-year Senior program, omitting Philosophy and Reigion.

MECHANICAL ENGINEERING

Sub-Senior Year

G. E. 115 (Mech. Dynamics)	2		2	G.E. 116 (Mech. of Fluids)	2		2
G. E. 165 (Dynamics Lab.)		3	1	G.E. 166 (Fluids Lab.)		3	1
E.E. 125 (Elec. & Mag. Cir.)	3		3	E.E. 126 (Elect. Mach.)	3		3
E.E. 175 (Elect. Lab.)		3	1	E.E. 176 (Elect. Lab.)		3	1
M.E. 125 (Heat Power)	3		3	M.E. 126 (Heat Power)	3		3
M.E. 175 (M. E. Lab.)		3	1	M.E. 176 (M. E. Lab.)		3	1
M. E. 189 (Mach. Design)		6	2	M.E. 191 (Mach. Design)		6	2
Philosophy 33	3		1½	Philosophy 34	3		1½
Religion 103	2		½	Religion 104	2		½
	13	15	15		13	15	15

Senior Mechanical Engineering Year

Same as four-year Senior program, omitting Philosophy and Religion.

COLLEGE OF LAW

INTRODUCTION

The purposes of the College of Law are:

To give a thorough training in the fundamental principles of English and American Law, and the modification thereof peculiar to the State of California;

To guide the student by actual practice in office work and court procedure to a proper application of the principles of law to concrete cases;

Finally, to imbue the student with the correct ethical principles that should govern the legal profession.

The general method of instruction followed is the Case System—an exact discussion of the cases presented in the best manuals with a view to deriving the principles which have determined their decisions. This study of rules and principles is never lost sight of by the professor and is rigidly exacted from the student in all examinations.

Lectures on particular phases of the law are given from time to time by the Faculty and by occasional lecturers.

The Faculty strongly recommends all students to take advantage of these courses because they are of great value in developing the reasoning faculties and in grounding the student in sound principles of ethical conduct—two things absolutely necessary to the soundest and highest success in the legal profession.

The College of Law maintains a system of Moot Courts, presided over by members of the Faculty. The Court holds bi-weekly sessions in which cases are argued by students in accordance with approved appellate procedure. On given statements of facts the legal issues involved are thoroughly briefed and argued by student counsel subject to constant instruction, advice and correction of the judges.

Besides the bi-weekly sessions of the Moot Court, an annual public competition known as the Coolidge Competition is held. Prizes are awarded to the winning counsel of the annual Coolidge Competition.

Within the Law School is maintained an honorary society known as the Woolsack, membership in which is restricted to students who maintained an average better than 1.5 for at least three consecutive semesters.

No student in the College of Law is allowed to take the State Examination for admission to the Bar before he has completed successfully the course of study prescribed by the University for the LL. B. degree or the Certificate in Law, and until such successful completion of the course has been certified to by the Dean of the College of Law and by the Dean of the Faculties. Immediate exclusion from the College of Law will follow any violation of this regulation.

ENTRANCE REQUIREMENTS

The College of Law is open to the following classes of students:

1. Those who have the degree of Bachelor of Arts, Bachelor of Science, or their equivalent from this school or a similar degree from some other college or university of approved standing and who have maintained an average of 1.5 or better in the upper division of their college work.

2. Subject to the discretion of the faculty, those who have completed the first three years of college work either at this university or at some college or university offering satisfactory courses leading to academic degrees and who have maintained an average of 1.5 or better in the work of the junior year.

3. Students who have followed courses in the College of Arts and Sciences at this university for three years and who have maintained an average of 2, or B, in the work of their junior year may satisfy the requirements of the Bachelor's degree in their senior year by following the first year law courses and the course in Ethics. Such students will then qualify for the Bachelor of Laws degree after two more years of study in the College of Law.

In computing averages, C-1, B-2, and A-3.

Students of the above classes are REGULAR STUDENTS.

4. In rare instances graduates of approved high schools with credits of recommended grade who lack the necessary college credits as specified above but whose experience in business or whose private study has made up for their lack of collegiate training and whose maturity and seriousness fit them, in the discretion of the Faculty, for the study of law. Such are, for example, young men employed in insurance and real estate offices, banks, railroad offices, and law firms, as well as those who have studied privately and so acquired knowledge for which, because of its variety and mode of acquisition, educational institutions are unable, as a rule, to give credit. These are SPECIAL STUDENTS. Under no circumstances will the number to be admitted each year exceed the limits prescribed by the ruling of the Association of American Law Schools.

Advanced Standing. Any person who has been in regular attendance for at least one academic year at another law school, having similar admission requirements, and approved either by the American Bar Association or the Association of American Law Schools, may in the discretion of the Faculty of the College of Law, and on such terms as it may prescribe, receive credit for the work done at such other law school not exceeding in any case two years. The last year must be spent in residence in the College of Law.

In order to graduate or receive the certificate, the student must—

1. Have received credit for at least 72 units in the College of Law (a unit is the equivalent of one hour a week for one semester.) No student is allowed a unit in any course at which he has not been present for 90 percent of the class hours and in which his average is not at least of D grade. The credit may be earned in part on the basis of work done in other law schools on the part of students admitted to advanced standing as specified above.

2. Have obtained in the work of his senior year a general grade point average of C with a weighted average of C for the work of the entire three years.

3. Have fulfilled the requirement of residence for three years in either this College of Law or some other approved law school, or both, the last year of which in any event must have been spent in this College of Law.

The degree of BACHELOR OF LAWS will be conferred on those students:

1. Who possess academic degrees before beginning the study of law and have satisfied the requirements set down in 1, 2 and 3 above.

2. Who have completed three years of college work leading to an academic degree and have satisfied the requirements set down in 1, 2 and 3 above.

The CERTIFICATE OF LAW will be conferred on special students who throughout their course have satisfied the requirements set down in 1, 2 and 3 above.

The Coolidge Competition

This competition, established in 1934 in honor of Dean Emeritus Clarence C. Coolidge, consists in the public trial of a supposititious case before a bench composed of three judges chosen from the appellate courts of the State. The competing counsel, two on each side, are chosen from the students who compete inthe weekly Moot Court sessions of the College of Law. Suitable prizes, as indicated elsewhere, are awarded to the successful counsel. The competition serves as a climax to the moot court work of the students throughout the school year. Its purposes are to stimulate among the students the desire for legal research and to develop their power for legal analysis.

DESCRIPTION OF COURSES

BIOLOGY

Students who wish to make Biology their major subject must complete Chemistry 5 and 6 as well as Biology 21 and 22 with at least a grade of C before beginning any of the upper division courses in Biology.

The major program must include at least 18 units of upper division courses in Biology and at least six units in either Physics or Chemistry. A grade of C must be maintained in all courses of the major, and, at the end of the senior year, each student must pass a comprehensive final examination.

21. General Zoölogy. An introduction to the broader principles of animal biology. Topics treated to include: protoplasm, the cell, metabolism, organ systems, adaptations, inheritance, etc. The lectures are supplemented by the laboratory study of certain animal forms. Two hours lecture, six hours laboratory. First semester. Four units.

22. General Zoölogy. A continuation of Biology 21. Two hours lecture, six hours laboratory. Second semester. Four units.

Biology 21 and 22 are prerequisite to all other courses of this department except Biology 23-24.

23-24. General Biology. An introductory course dealing with fundamental biological processes and principles. It is designed to meet the needs of those who do not plan to proceed to more advanced work in Biology. Laboratory work is designed to illustrate and supplement the lectures. Three hours lecture, three hours laboratory. Both semesters. Eight units.

Prerequisite: H. S.—Chemistry is desirable.

101. Vertebrate Anatomy. A comparative study of the structure, organization, adaptation and classification of the vertebrate animals. In the laboratory the student dissects the dogfish, necturus and the cat. Two hours lecture, six hours laboratory. One semester. Four units.

102. Vertebrate Embryology. A study of the processes of cell division, gametogenesis, fertilization, cleavage, gastrulation, germ layer formation, organogenesis and the extra-embryonic membranes. In the laboratory the processes of development are studied from gross material and serial sections. Particular attention is given to the amphibian, bird and mammal. Two hours lecture, six hours laboratory. One semester. Four units.

Prerequisite: Biol. 22 and 101.

103. Invertebrate Zoölogy. The anatomy, classification and life histories of the invertebrates. Two hours lecture, six hours laboratory. One semester. Four units.

104. History of Biology. The history of the development of Biology in its various branches to their present status, with biographical sketches of the leaders in each field. The outlook for the future. Two hours lecture. One semester. Two units.

105. Taxonomy and Ecology. A course designed to acquaint the student with the principles of classification and ecology as evi-

denced by certain animal groups. Emphasis is laid upon field work. One hour lecture, three hours laboratory. First semester. Two units.

106. Taxonomy and Ecology. A continuation of Biology 105. One hour lecture, three hours laboratory. Second semester. Two units.

107. General Histology. A study of the cell and the cellular structure and histogenesis of the basic types of tissues. Prerequisites: General Zoölogy and Vertebrate Anatomy. Two hours lecture, six hours laboratory. Four units.

108. Special Problems. Individual work in some specialized branch of biology may be undertaken by senior students who have shown exceptional ability. Hours and units to be arranged.

109. Histological Technique. A laboratory course, supplemented by lectures and demonstrations, in the principles and use of apparatus commonly in use in biological laboratories, together with practical instruction in the more commonly used methods of preparing biological material for microscopic study. Six hours laboratory. Two units.

110. Heredity. An introductory course designed to give a working knowledge of the fundamental principles governing inheritance in plants and animals. Two hours lecture. One semester. Two units.

CHEMISTRY

Students who wish to make Chemistry their major subject must complete Chemistry 5 and 6, 9 and 10; Physics 1-4; Math. 1, 2 and 6 with at least a grade of C before beginning any of the upper division courses in Chemistry.

The major program must include 24 units of upper division courses in Chemistry. A grade of C must be maintained in all courses of the major, and, at the end of the senior year, each student must pass a comprehensive final examination.

Courses in Math. 7, 8 and 9 are required for students choosing Chemistry as their major subject.

5. Inorganic Chemistry. A study of the fundamentals and properties of the elements and compounds with solution of problems. Includes a more thorough discussion and mastery of the laws and theories of Chemistry. Laboratory study and quiz accompany the lectures. Three hours lecture, six hours laboratory. First semester. Five units.

6. Inorganic Chemistry. A continuation of Chem. 5. The laboratory study includes a course in Qualitative Analysis consisting of a systematic analysis of cations and anions, together with quizzes and solutions of illustrative problems. Three hours lecture, six hours laboratory. Second semester. Five units.

Chemistry 5 and 6 are prerequisite to all other courses of this department except Chem. 11 and 12.

9. Volumetric Analysis. Introduction to the common methods of volumetric analysis. Problem discussion. One hour lecture, nine hours laboratory. Second semester. Four units.

10. Gravimetric Analysis. Introduction to the common methods of gravimetric analysis. Problem discussion. One hour lecture, nine hours laboratory. Second semester. Four units.

11. General Inorganic Chemistry. Discussion of elementary principles and properties of the more important elements with their compounds. Includes a systematic study of important theories. Laboratory and quiz to accompany the lectures. This course is designed to meet the needs of those who do not plan to proceed to more advanced work in Chemistry. Three hours lecture, three hours laboratory. First semester. Four units.

12. General Inorganic Chemistry. A continuation of Chem. 11. Three hours lecture, three hours laboratory. Second semester. Four units.

17. Quantitative Analysis. A study of both Gravimetric and Volumetric analysis. Intended primarily for Pre-Medical Students. One hour lecture, six hours laboratory. First semester. Three units

18. Physical Chemistry. An elementary course reviewing those principles having important applications in the medical sciences. Intended for Pre-Medical Students. No laboratory. Two hours lecture. Second semester. Two units

130. Organic Chemistry. The Aliphatic Compounds. Introduction to organic chemistry. A course dealing with the chief classes of the chain compounds of carbon. Includes preparative work and a brief introduction to qualitative organic chemistry. Three hours lecture. Six hours laboratory. First semester. Five units.
Prerequisite: Chem. 9, 10.

131. Organic Chemistry. The Aromatic Compounds. A continuation of Chemistry 130 but dealing with the cyclic compounds. Preparative work. Three hours lecture. Six hours laboratory. Second semester. Five units.
Prerequisite: Chem. 130.

136. Organic Preparations. The study and preparation of typical carbon compounds under the direction of the instructor. Three hours laboratory. One semester. One unit.
Prerequisite: Chem. 130.

138. Chemical Problems. A descriptive study of the problems involved in industrial processes and manufacturing methods. Two hours lecture. One semester. Two units.
Prerequisite: Chem. 130, 150, 151.

145. Physiological Chemistry. A discussion of the more important facts of bio-chemistry as related to the animal body in a form which will be understandable to a student with a limited preparation in chemistry tnd biology. Primarily for science students. One hour lecture. One semester. One unit.
Prerequisite: Chem. 131.
for chemistry majors only. Three hours lecture, six hours laboratory.

150. Physical Chemistry. A course intended for those who have sufficient training in Physics and Mathematics to enable them to solve the ordinary physical problems involving Calculus. The subject matter will be that of a general course. Three hours lecture, six hours laboratory. First semester. Five units.

151. Physical Chemistry. A continuation of Chem. 150, completing the discussion of the principles of physical chemistry. Intended Second semester. Five units.

156. Hydrogen Ion. A discussion of pH, its determination and application to medicine and allied sciences. Intended primarily for senior Pre-Medical students. Two hours lecture. One semester.
Pre-requisites: Chem. 18, 131. Two units.

160. Advanced Inorganic Chemistry. Discussion of generalities of Periodic System, coordination theory of Werner, proton concept of acids and bases, non-aqueous solvents, rare earths, preparation and properties of uncommon elements. Two hours lecture. One semester.
Prerequisite: Chem. 150, 151. Two units.

166. Inorganic Preparations. Laboratory course intended to accompany Chem. 160. Preparttion of both common and unusual chemicals through the use of scientific literature. Three hours laboratory. One semester. One unit.
Prerequisite: Chem. 9, 10.

180. Methods of Research—Introduction to the methods of research; the use of the literature of chemistry and the study of the methods of famous scientists. One unit.
Prerequisite: At least 15 units of Upper Division chemistry.

CIVIL ENGINEERING

1. Elements of Surveying. Theory, use, and adjustment of tape, compass, level and transit. Land and city surveying. Methods of computing areas. Two hours lecture. First semester.
Prerequisite: Sophomore standing. Two units.

2. Higher Surveying. Base line measurement and triangulation. Trigonometric, barometric and precise leveling. The plane table. Topographic and hydrographic surveying. One hour lecture. Second semester.
Prerequisite: C. E. 1. One unit.

3. Elements of Surveying. Theory and use of the tape, level, compass and transit. For Electrical and Mechanical Engineering students. One hour lecture. First semester.
Prerequisite: Sophomore standing. One unit.

4. Summer School of Surveying. Field and office work. Practical problems in highway, railway and topographic surveying. Four weeks immediately following the sophomore year. Fee$25.00
Prerequisite: C. E. 3. Four units.

6. Surveying. Theory, use and adjustment of tape, compass, level, transit and plane table. Land and city surveying. Topographic surveying and methods of computing areas. Two hours lecture. Second semester. Two units.

7. Surveying. A continuation of C. E. 6. One hour lecture. First semester.
Prerequisite: C. E. 6. One unit.

8. Summer School of Surveying. Field and office work. Practical problems in highway, railway and topographic surveying. Four weeks immediately following the second semester of the sophomore year. Fee $25.00
Prerequisite: C. E. 7. Four units.

11. Surveying Practice. Field methods in the use of the chain, compass, level and transit. Six hours field practice. First semester.
Prerequisite: To accompany C. E. 1. Two units.

12. Surveying Practice. Practice in solar and stellar observations for the determination of azimuth, latitude, longitude and time. Three hours field practice. Second semester.
Prerequisite: To accompany C. E. 2. One unit.

13. Surveying Practice. Field methods in the use of the chain, compass, level and transit. For Electrical and Mechanical Engineering students. Three hours field practice. First semester.
Prerequisite: To accompany C. E. 3. One unit.

57. Surveying Practice. Field methods in the use of the tape, compass, level and transit. Six hours field practice. First semester.
Prerequisite: To accompany C. E. 7. Two units.

58. Surveying Practice. Practice in solar and stellar observations for the determination of azimuth, latitude, longitude and time. Three hours field practice. Second semester.
Prerequisite: C. E. 57. One unit.

101. Graphics. Principles and methods of determining the reactions and bending moments of beams and trusses. Determination of stresses in roof and bridge trusses. One hour lecture. First semester.
Prerequisite: Junior standing. One unit.

102. Structures. Analytical study of framed trusses with fixed loads. Plate girders and mill buildings. Three hours lecture. Second semester.
Prerequisite: C. E. 101. Three units.

103. Structures. Analysis of bridge trusses for dead, live, impact and lateral loads. Deflection of trusses and trusses with redundant members. Wind stress analysis of buildings. Continuous frames and secondary stresses. Three hours lecture. First semester.
Prerequisite: C. E. 102. Three units.

106. Reinforced Concrete and Masonry. Principles and practice of reinforced concrete as applied to beams, girders, floor slabs, columns and footings. Masonry structures. Four hours lectures. Second semester. Four units.
Prerequisite: Senior standing.

107. Structural Design. Methods and design of steel and timber structures. Three hours lecture. First semester. Three units.
Prerequisite: C.E. 102.

108. Soil Mechanics. A study of the origin, composition, characteristics and structural properties of soils. Three hours lecture. Second semester. Three units.
Prerequisite: Senior standing.

109. Route Surveying. Simple, compound, reverse and transition curves. Vertical curves. Earthwork and the mass diagram. Two hours lecture. First semester.
Prerequisite: Junior standing. Two units.

116. Transportation Engineering. Design, construction and maintenance of roads and pavements. Two hours lecture. Second semester. Two units.
Prerequisite: Senior standing.

117. Sanitary Engineering. Collection, purification and disposal of sewage. Sewage treatment works. A study of source, the quality

and quantity of water necessary for a municipal supply. Works for the collection, purification and distribution of water. Four hours lecture. First semester.
Prerequisite: Senior standing. Four units.

118. Transportation Engineering. Organization and administration of railroads. Methods and practice of railroad location, maintenance and reconstruction. Three hours lecture. Second semester.
Prerequisite: Senior standing. Three units.

119. Sanitary Engineering. The design of sewerage systems and structures. One hour lecture. First semester. One unit.
Prerequisite: Senior standing.

120. Sanitary Engineering. The bacteria in natural water and the quantitative bacteriological examination of water. Two hours lecture. Second semester. Two units.
Prerequisite: Senior standing.

121. Graphics. Principles and methods of determining the reactions and bending moments of beams and trusses. Determination of the stresses in roof and bridge trusses. One hour lecture. First semester.
Prerequisite: Junior standing. One unit.

122. Structures. Analytical study of framed trusses with fixed loads. Plate girders and industrial buildings. Analysis of bridge trusses with dead, live, impact and lateral loads. Four hours lecture. Second semester.
Prerequisite: C. E. 121. Four units.

123. Structures. Deflection of trusses and trusses with redundant members. Wind stress analysis of buildings. Continuous frames and secondary stresses. Moment distribution method of analysis. Two hours lecture. First semester.
Prerequisite: C. E. 122. Two units.

124. Reinforced Concrete. Principles and practice of reinforced concrete as applied to beams, girders, floor slabs, columns and footings. Reinforced concrete structures. Four hours lecture. Second semester.
Prerequisite: Senior standing. Four units.

125. Structures. Methods of design of steel, timber and concrete structures. Two hours lecture. First semester.
Prerequisite: C. E. 124. Two units.

126. Soil Mechanics. A study of the origin, composition, characteristics and structural properties of soils. Two hours lecture. Second semester.
Prerequisite: Senior standing. Two units.

131. Sanitary Engineering. Collection, purification and disposal of sewage. Sewage treatment works. A study of the source, quality and quantity of water necessary for a municipal supply. Works for the collection, purification and distribution of water. Three hours lecture. First semester.
Prerequisite: Senior standing. Three units.

133. Sanitary Engineering. The design of sewerage systems and structures. Two hours lecture. First semester.
Prerequsite: Senior standing. Two units.

134. Sanitary Engineering. The bacteria in natural water and the quantitative bacteriological examination of water. Two hours lecture. Second semester.
Prerequisite: Senior standing. Two units.

142. Transportation Engineering. Design, construction and maintenance of roads and pavements. Two hours lecture. Second semester.
Prerequisite: Senior standing. Two units.

144. Transportation Engineering. Organization and development of state and local highway administration. Development of highway systems. Highway financing. Municipal highway departments. Two hours lecture. Second semester.
Prerequisite: Senior standing. Two units.

151. Graphic Problems. Graphic solutions of static problems. Six hours lecture and drafting. First semester.
Prerequisite: To accompany C. E. 101. Two units.

152. Structural Design. The design of the roof truss and the supporting columns of a mill building. Shop drawing of the structure. Six hours lecture, computation and drafting. Second semester.
Prerequisite: To accompany C. E. 102. Two units.

153. Structural Design. The design and drawing of a single track railway plate girder. Six hours lecture, computation and drafting. First semester.
Prerequisite: To accompany C. E. 103. Two units.

154. Structural Design. The design of a through riveted steel bridge truss. The analysis and design of a small concrete structure. Six hours lecture, computation and drafting. Second semester.
Prerequisite: C. E. 153. Two units.

159. Surveying Practice. Field practice in laying out simple, compound, reverse and transition curves. Three hours field practice. First semester.
Prerequisite: To accompany C. E. 109. One unit.

160. Structural Design. The design and shop drawing of steel structures. For Mechanical Engineering students. Six hours lecture, computation and drafting. Second semester. Two units.
Prerequisite: Senior standing.

166. Transportation Laboratory. Standard methods of testing bituminous and non-bituminous highway materials. Six hours laboratory. Second semester.
Prerequisite: To accompany C. E. 116. Two units.

167. Sanitary Laboratory. Standard practice in the common tests of sanitary and industrial wastes and polluted and contaminated waters. Three hours laboratory. First semester.
Prerequisite: To accompany C. E. 117. One unit.

168. Sanitary Laboratory. Laboratory work in the bacteriological examination of water. Three hours laboratory. Second semester. One unit.
Prerequisite: To accompany C.E. 120.

169. Sanitary Design. The design of sewerage systems and structures. Six hours computation and drafting. First semester.
Prerequisite: To accompany C.E. 119. Two units.

170. Thesis. The investigation of some engineering problem and the writing of an acceptable thesis. Conference as required. Second semester.
Prerequisite: Senior standing. Two units.

171. Graphic Problems. Graphic solutions of static problems. Six hours lecture and drafting. First semester.
Prerequisite: To accompany C. E. 121. Two units.

172. Structural Design. The design of the roof truss and the supporting columns of a steel mill building. Shop drawing of the structure. Six hours lecture, computation and drafting. Second semester.
Prerequiste: To accompany C. E. 122. Two units.

173. Structural Design. Designs of columns, beams and girders. Design of railway plate girder. Six hours lecture, computation and drafting. First semester.
Prerequisite: To accompany C. E. 123. Two units.

174. Structural Design. Design of a welded or riveted bridge truss. Design of a small reinforced concrete structure. Three hours lecture, computations and drafting. Second semester.
Prerequisite: C. E. 123. One unit.

175. Structural Design. Design of timber and concrete structures. Three hours lecture, computations and drafting. First semester.
Prrequisite: To accompany C. E. 125. One unit.

176. Soils Laboratory. Field and laboratory practice in the collection and examination of the physical properties of soils. Three hours laboratory. Second semester.
Prerequisite: To accompany C. E. 126. One unit.

181. Sanitary Laboratory. Standard practice in the common tests of sanitary and industrial wastes and poluted and contaminated waters. Three hours laboratory. First semester.
Prerequisite: To accompany C. E. 131. One unit.

183. Sanitary Design. The design of sewerage systems and structures. Three hours computation and drafting. First semester.
Prerequisite: To accompany C. E. 133. One unit.

184. Sanitary Laboratory. Laboratory work in the bacteriological examination of water. Three hours laboratory. Second semester.
Prerequisite: To accompany C. E. 134. One unit.

192. Transportation Laboratory. Standard methods of testing cement, sand, gravel and other non-bituminous highway materials. Three hours laboratory. Second semester.
Prerequisite: To accompany C. E. 142. One unit.

194. Transportation Laboratory. Standard methods of testing bituminous highway materials. Three hours laboratory. Second semester.
Prerequisite: To accompany C. E. 134. One unit.

ECONOMICS

Students who wish to make Economics their major subject must have completed Economics 1 and 1B with a grade of at least C.

The major program must include 24 units of upper division work in economics including Economics 100, 110, 114, and 116. In addition to the units in economics the student must include six units in political science. A grade of C must be maintained in all courses of the major, and at the end of the senior year each student must be ready to pass a comprehensive final examination, written or oral.

Lower Division Courses

The following courses are open to students in all departments of the University, subject to the indicated prerequisite, if any.

Students whose major is Economics may elect Economics 10A and 10B in satisfaction of upper division requirements in economics toward graduation.

1A-1B. Principles of Economics. The student is made acquainted with the general principles, terminology and methods of analysis essential to an understanding of economic processes and problems. The work of the course centers around the four dominant phases of economics: consumption, production, exchange, and distribution. Three hours lecture. Two Semesters.

Prerequisite: Sophomore standing. Six units.

10A. Principles of Accounting. A study of the basic principles underlying modern accounting processes with particular emphasis upon their application to the technique of classifying and recording actual business transactions. Three hours lecture, three hours laboratory. First semester.

Prerequisite: Sophomore standing. Four units.

10B. Principles of Accounting. A continuation of Economics 10A. Special attention is given to the problems peculiar to the sole proprietorship, partnership and corporation. Elementary ideas on the problem of asset valuation are also discussed. Three hours lecture, three hours laboratory. Second Semester.

Prerequisite: Economics 10A. Four units.

11. Introduction to Business. A study of the structure and functioning of business enterprise with emphasis upon the principles and methods of business. Two hours lecture. One semester. Two units.

Three hours lectures. One semester. Three units.

30A-B. Survey of Accounting. This course is designed to meet the needs of students who contemplate the practice of law. To that end the phases of accounting treated are those which involve a consideration of partnerships, corporations, ventures, syndicates, estates, trusts, insolvent enterprises, and the problems involving asset valuation in public utility rate cases. Two hours lecture. Two semesters. Four units.

Upper Division Courses

Group A

All courses in this group are open to anyone who has passed Economics 1A-1B with a grade of at least C and who has fulfilled the specific prerequisite of the course in question.

100. Principles of Statistical Method. The object of this course is twofold: Firstly, it presents the techniques of elementary statistic-

al analysis as tools appropriate for the study of quantitative data. Secondly. it considers the logic of statistical induction and the inherent limitations imposed thereon by the nature of the data themselves. The subject matter includes averages, variation, elementary ideas of index numbers, simple linear correlation and elementary time series analysis. Three hours lecture, three hours laboratory. Second Semester.

Prerequisite: Mathematics 1. Four units.

101. Statistical Analysis. Application of the methods of basic least squares with particular reference to the problems of multiple, partial, and curvilinear correlation. Special attention will be given to certain techniques appropriate to the solution of correlations involving time series. Three hours lecture. First semester.

Prerequisite: Economics 100. Four units.

102. Statistical Analysis. The principles of statistical inference will be considered together with the problems of small samples, tests of significance, statistical estimation, contingency tables, and analysis of variance and covariance. Three hours lecture. Second semester.

Prerequisite: Economics 101. Four units.

110. History of Economic Doctrines. A survey of economic theories and doctrines from Plato to Alfred Marshall. The various types of theory are contrasted and compared and their relationship to the general economic and social history of the period indicated. Three hours lecture. First semester. Three units

114. Economic Theory. An analysis of cost and price relationships in the individual firm and in the industry of which it is a part. The three special cases of pure competition, monopolistic competition, and pure monopoly will be discussed. No attempt will be made to discuss the distribution of the "national dividend." Distribution will be discussed only in terms of the pricing process; that is, only in so far as factors of production must be considered in making adjustments to cope with new price-cost relationships. Three hours lecture. Second semester. Three units.

116. Economic History of the United States. A study of the economic history of the United States, with special reference to problems arising from the factory system and large scale production. Two hours lecture. First semester. Two units.

120. Public Finance and Taxation. A course devoted to the analysis of public expenditures and public revenues. In the case of expenditures, particular emphasis will be placed on the change in the qualitative nature of those expenditures when commanded by government and the effects of such changes on the private economy. The section of the course devoted to public revenues will consider taxes peculiar to the United States in such a way as to determine the ultimate bearers of the burden of those taxes. Three hours lecture. First semester. Three units.

122. Money and Banking. An analysis of the fundamental concepts of money. The discussion of money will be followed by an analysis of commercial banking principles. Emphasis will be placed upon the commercial bank as a "manufacturer of the means of payment." The discussion of commercial banking will, of necessity, entail consideration of the philosophy, technique and policy of central banking. Mindful of the fact that the United States possesses a monetary

and banking system peculiar to itself, consideration will be given to "money of the United States," the National Banking System and the Federal Reserve System, whenever possible or necessary. Three hours lecture. Second Semester. Three units.

126. Business Cycles. An introduction to the analysis of fluctuations in the level of general business activity. Specific theoretical formulations explaining business cycles will be discussed. This will be followed by a discussion of the history of business fluctuations, the problem of control and the attainment of stability. Three hours lecture. Second semester.

Prerequisite: Economics 100. Three units.

150. Labor Problems. Lectures and class discussion on (1) the problems: insecurity, wages and income, hours and work periods, sub-standard workers, industrial autocracy; and (2) attempts to solve them: by employees, by employers, by government. Three hours lecture. First semester. Three units.

180. International Trade. It is the purpose of this course to present the generally accepted results of the theoretical investigations of the past, and then to give the student the modern doctrine of the manner in which international adjustment to economic change occurs. The theories and operation of foreign exchange and its economic influence upon industry and trade will be considered in order that the student may be thoroughly acquainted with the analytical tools that are available for use in understanding the importance of government policy in international trade. Three hours lecture. Second semester. Three units.

181. Principles of Marketing. The nature and importance of marketing; nature of producer and consumer; extent of and forces behind markets; marketing functions; cooperative marketing; methods and channels of distribution; the transportation problems connected with marketing; market price; government authority; trends in present marketing methods and policies. Three hours lecture. First semester. Three units.

Group B

Enrollment in all courses in this group is limited to students registered in the College of Business Administration.

121. Corporation Finance. An introduction to the problems surrounding the procurement of funds needed for carrying on a modern business enterprise. Topics covered will include: financial organization of modern industry; the instruments of enterprise finance; promotion and sale of securities; financing of operations of the going-concern; problems of financing growth and expansion; financial readjustments. Only one unit of credit will be allowed to those who have had Economics 131 (Accounting: Proprietorship). Three hours lecture. First semester. Three units.

124. Investments and Investment Institutions. As Corporation Finance deals with the problems of business management devising ways and means of procuring funds for enterprise operations, so this course will deal with the market for funds as viewed by those individuals and institutions who are offering those funds in that market. Therefore, among the subjects to be considered will be the nature of the money market; institutions operating therein; and because of the significance of the presence of government, government control thereof. It will be presumed that a student electing this

course possesses a working knowledge of commercial and central bank operations and of the fundamentals of enterprise finance. Three hours lecture. One semester. Three units

125. Special Studies in Corporation Finance. A detailed analysis of specific problems in corporation finance. The background and needs of those enrolling will determine the specific topics covered. Second semester.
Prerequisite: Consent of instructor. Units by arrangement.

127. Problems in Public Finance. A continuation of Economics 120. Attention will be given to current problems in fiscal matters. Second semester.
Prerequisite: Consent of instructor. Units by arrangement.

130. Accounting Valuation. A study of the theory and technique applied in the valuation of assets and liabilities in the preparation of private enterprise balance sheets and profit and loss statements. Consideration will also be given, where appropriate, to the similarities and differences between the accountants' problem of valuation and the economists' problem of value. Two one-hour lectures and one two-hour laboratory. First semester.
Prerequisite: Economics 10B. Three units.

131. Accounting: Proprietorship. Problems arising from the existence of more than one proprietor in an enterprise will be discussed as well as the techniques and theory underlying the accounting for interests in the net worth of an enterprise and changes therein. About one third of the course will be devoted to partnerships and the remaining two-thirds to corporations. Two one-hour lectures; one two-hour laboratory. Second semester.
Prerequisite: Economics 130. Three units.

132. Accounting Problems. The theory and technique underlying the preparation of statements for certain situations will be discussed and illustrative problems solved. Among the topics discussed will be joint ventures, bankruptcy, intercompany stockholdings, and estates and trusts. Other special problems by arrangement with the instructor.
Prerequisite: Economics 131 and
Consent of instructor. Units by arrangement.

133. Cost Accounting. A study of the problems involved in recording the internal transactions of modern business enterprise, for use by management in control of activities. Particular emphasis is on industrial concerns but application to trading concerns, both wholesale and retail, are discussed. Particular topics include the determination of unit product costs, departmental costs, allocation of overhead, standard costs and budgetary control. Three hours lecture. Second semester.
Prerequisite: Economics 10B. Three units.

134. Accounting Systems. The theoretical and practical problems involved in setting up accounting systems will be considered with special reference to the prompt preparation of reports for the use of management and the minimizing of costs of operating the system. First semester.
Prerequisite: Economics 131 and
Consent of instructor. Units by arrangement.

135. Analysis of Financial Statements. This course is concerned with the interpretation of the statistical significance of the numerical data compiled from accounting and supplementary records. Emphasis is placed upon the statistical interpretation of the typical financial statements and interim reports prepared for the use of management. Three hours lecture. Second semester.

Prerequisite: Economics 100 and
Economics 131. Three units.

136. Industrial Cost Analysis and Research. This course consists of two parts: (a) advanced study in problems of cost accounting, e.g., investigation of problems of allocation of production costs; analysis and determination of overhead cost rates; determination of differential production costs; standard setting for standard cost systems; installation of standard cost systems and their use for control; (b) production cost research in representative industrial plants in this geographic area. Two-thirds of the course time will be spent in investigations of real cost problems in these plants. This is to train the student in the practical application of cost techniques to the determination and analysis of firm costs. Three hours. One semester.

Prerequisite: Econ. 133 and Consent of Instructor. Three units.

138. Income Taxation. This course presents the underlying principles of income taxation and the special accounting and management problems involved in the determination of tax liability. The course develops the concept of taxable income and deals with special problems of individuals, partnerships, trusts, and corporation income taxes. Three hours lecture. One semester. Three units.

140. Mathematical Principles of Finance. A study of the algebraic technique applicable to the solution of problems involving interest and discount. Among the topics discussed will be interest, discount, fund accumulations, debt amortizations, and the rudimentary principles of life insurance premiums and reserve. Attention will also be given to the relationship of this work to students of accounting and of finance. Three hours lecture. First semester.

Prerequisite: Mathematics 1. Three units.

160. Business Management. The purpose of this course is to give the student a working knowledge of fundamental principles underlying the management of business enterprises. The student is trained in methods of identifying and evaluating the influences upon a business enterprise, and then is given a comprehensive view of modern practices of planning, organizing, and controlling various functional activities in business. Three hours lecture. First semester. Three units.

165. Retailing. A study of the organization and management of retail establishments. Among the topics discussed will be: store location; organization; policies; sales systems; profit; turnover; buying; the physical control of inventories; personnel; statistics; summaries for management control. Three hours lecture. Second semester.

Prerequisite: Economics 160. Three units.

166. Industrial Personnel Management. The purpose of the course is to give the students a thorough knowledge of the principles of scientific management and the ability to recognize the limitations and uses of the tools and mechanisms of management. Throughout the course, such management devices as present-day industrial tendencies, labor maintenance and control, wage payment and wage in-

centives, inspection, and cost analysis are studied as aids in clarifying and solving management problems. Three hours. One semester. Three units.

182. Marketing Problems. The philosophy and technique of the scientific method applied to market problems. Practical research procedure; sources of market facts; methods of collecting and treating market data; research agencies; the development of marketing methods and policies based upon the results of market research. Three hours lecture. One semester.

Prerequisite: Economics 100 and Economics 181. Three units.

184. Advertising. Fundamental principles; an analysis of the important psychological factors in advertising. Human wants; buying motives and reactions are studied to comprehend the effects of various practices and methods of advertising upon consumers and middlemen. Three hours lecture. One semester. Three units

EDUCATION

A, B. Prescribed Physical Training for Freshmen. All Freshmen who are in no way physically defective are required to meet twice a week for physical training. Those who do regular work in baseball, basketball, boxing, football, swimming or tennis are exempt from the physical training classes. Two hours weekly throughout the year. One unit.

6. A General Course in the History of Education. Primitive and oriental. Greek. Roman. Early Christian and mediaeval. Monastic schools and the development of Scholasticism. The founding of universities in the various parts of Europe. Two hours. One semester. Two units.

7. Modern Education. Continuation of Educ. 6. The Renaissance in education. The Reformation and education. The Jesuit system of education. The great educational reformers. The development of the national school systems in Europe and the United States. Two hours. One semester. Two units.

8. Teacher's Courses in High School English. The rhetoric to be taught in high school. Its method of presentation and its application to written composition. Graduation and development of written composition. Methods of correction. Standards of evaluation. The literature to be studied. The method for its presentation and study. Oral English. Two hours. One semester. Two units.

101. History of Education. The development of educational thought beginning with the Greek and Roman periods to modern times. Embraces in particular the dominant phases of modern education; the influence of Greek and Medieval education on the systems prevalent today. Three hours. One semester. Three units.

102. Principles of Education. A survey of the theories and general principles of education considered as affecting the present day social order. Two hours. One semester. Two units.

103. Educational Psychology. A study of the mental development of man, mental testing; moral and religious development; general laws of learning.Three hours. One semester. Three units.

Pre-requisite: Educ. 101, 102.

104. Secondary Education. A complete survey of secondary education; particular emphasis on the functions, scope and curricula of secondary education in relation to present day social needs. Three hours. One semester. Three units.
Pre-requisite: Educ. 101, 102.

105. Statistical Methods in Education. Collection of data; measures of central tendency; measures of variability; the normal probability curve; correlation; validity; interpretation of statistical findings. Three hours. One semester. Three units.
Pre-requisite: Educ. 103.

106. Tests and Measurements. The purpose of measurement in education; standardized tests of intelligence and achievement; other means of evaluating learning. Three hours. One semester.
Pre-requisite: Educ. 105. Three units.

108. Psychology of High School Subjects. An analysis of the psychological factors affecting the learning of high school subjects; review of experimental studies of the significance in teaching high school subjects. Three hours. One semester. Three units.
Pre-requisite: Educ. 103.

ELECTRICAL ENGINEERING

101. Electric and Magnetic Circuits. Fundamental laws and principles of electric and magnetic circuits. Three hours lecture. First semester.

Prerequisite: Junior standing in Electrical or Mechanical Engineering. Three units.

102. Direct Current Machinery. Direct current apparatus and machines. Three hours lecture. Second semester.
Prerequisite: E. E. 101. Three units.

103. Principles of Alternating Current Circuits. A study of the fundamentals involved in alternating current circuits. Three hours lecture. First semester.
Prerequisite: E. E. 102. Three units.

104. Alternating Current Machinery. A study of the theory, construction and operating characteristics of alternating current machines. Four hours lecture. Second semester.
Prerequisite: E. E. 103. Four units.

105. Elements of Electrical Engineering. A course in direct current and alternating current circuits and machines for Civil Engineering students. Two hours lecture. First semester.
Prerequisite: Junior standing in Civil Engineering. Two units.

106. Elements of Electrical Engineering. Continuation of E. E. 105. Two hours lecture. Second semester.
Prerequisite: E. E. 105. Two units.

107. Electronics. Principles and applications of electronic tubes and associated equipment. Three hours lecture. First semester.
Prerequisite: To accompany E. E. 103. Three units.

108. Electronics. Continuation of E.E. 107. Three hours lecture. Second semester. Three units.
Prerequisite: E.E. 107.

110. Electric Power Transmission. Fundamental characteristics and calculations of high voltage transmission lines. Three hours lecture. Second semester. Three units.
Prerequisite: E.E. 103.

111. Direct Current Laboratory. Experimental study of direct current machines and associated apparatus. Three hours laboratory First semester.
Prerequisite: To accompany E. E. 101. One unit.

112. Direct Current Laboratory. Continuation of E. E. 111. Three hours laboratory. Second semester.
Prerequisite: E. E. 111. One unit.

113. Alternating Current Laboratory. Experimental study of the performance of alternating current machines and associated apparatus. Three hours laboratory. First semester.
Prerequisite: To accompany E. E. 103. Two units.

114. Alternating Current Laboratory. Continuation of E. E. 113. Three hours laboratory. Second semester.
Prerequisite: E. E. 113. Two units.

115. Electrical Engineering Laboratory. Experimental study of direct and alternating current circuits and machines for Civil Engineering students. Three hours laboratory. First semester.
Prerequisite: To accompany E. E. 105. One unit.

116. Electrical Engineering Laboratory. Continuation of E. E. 115. Three hours laboratory. Second semester.
Prerequisite: E. E. 115. One unit.

117. Electrical Engineering Laboratory. Experimental study of electronic tubes and associated circuits. Applications of vacuum tubes to industrial control. Six hours laboratory. First semester.
Prerequisite: To accompany E.E. 107. Two units

121. Electrical Design. Electrical and mechanical theory applied to the design of direct current machinery. Six hours lecture, computation and drafting. First semester.
Prerequisite: E. E. 102. Two units.

122. Electrical Design. Alternating current machine design. Six hours lecture, computation and drafting.
Prerequisite: E. E. 121. Two units.

124. Power Plant Design. Principles of engineering economy applied to the selection of power plant sites and equipment. Layout of the electrical features of a complete power plant. Six hours lecture, computation and drafting. Second semester.
Prerequisite: E. E. 103 and E. E. 121. Two units.

125. Electric, Magnetic and Dielectric Circuits. A basic treatment of the fundamental engineering relationships applying to electric, magnetic and dielectric circuits. The phenomena treated underly all phases of electrical engineering. Circuit principles are applied to polyphase alternating current circuits. Three hours lecture. First semester.
Prerequisite: Junior standing in Electrical or Mechanical Engineering. Three units.

126. Electric Circuits and Machines. A study of the operating characteristics of direct current generators and motors, transformers, induction motor, synchronous motor and the single-phase motor. Principle features of these electrical devices are discussed

in the light of fundamentals previously developed. Three hours lecture. Second semester.
Prerequisite: E. E. 125 Three Units

127. Advanced Electric Circuits and Machines. Circuit fundamentals are applied to the study of single-phase alternating current circuits having non-sinusoidal voltages impressed upon them. Unbalanced polyphase loads are analyzed. Some features of direct current and alternating current machine behavior are developed more fully than in E. E. 126. Basic aspects of amplidyne generator operation and application are covered. Three hours lecture. First semester.
Prerequisites: E. E. 125 and E. E. 126. Three units.

128. Advanced Alternating Current Machines. Continuation of E. E. 127 to include harmonic suppresion in polyphase transformer banks, special connections of transformers, speed control of induction motors, power angle of alternators and synchronous motors, parallel operation of alternators, and special characteristics of single-phase motors. Three hours lecture. Second semester.
Prerequisite: E. E. 127 Three Units

131. Basic Electronics. Characteristics of high-vacuum and gas filled tubes. Control circuits for gas filled tubes used in direct current and alternating current circuits. Rectifiers and filters. Principal features of the more common types of amplifiers, oscillators, and detectors. Three hours lecture. First semester.
Prerequisite: E. E. 125 Three Units

132. Advanced Electronics. Continuation of E. E. 131 to more fully develop features of amplifiers, oscillators and detectors. Engineering aspects of amplitude-modulation, frequency-modulation and phase-modulation radio communication systems are treated. Three hours lecture. Second semester.
Prerequisite: E. E. 131 Three Units

135. Elements of Electrical Engineering. A course for Civil Engineering students dealing with the principles and applications of alternating and direct current circuits and machines. Three hours lecture. First semester.
Prerequisite: Junior standing in Civil Engiinering. Three units.

136. Communications Circuits. Analytical treatment of the theory of transmission lines and extension of the theory into some of the more common types of filters. Transmission line theory is developed from the point of view of its applications in telephony and radio. Three hours lecture. Second semester.
Prerequisite: E. E. 126 Three Units

138. Electric Circuit Transients. The behavior of electric circuits containing fixed circuit parameters, including some cases of coupled circuits, are analyzed by solution of the applicable differential equations. The solutions are discussed for their applications in electric power systems and in machines. Two hours lecture. Second semester.
Prerequisites: E. E. 125 and Math. 116; also concurrent registration in E. E. 188. Two Units.

140. Symmetrical Components. The techniques of the mathematical method of symmetrical components for solution of unbalanced polyphase system problems are developed and applied to study of faults on transmission systems and to the behavior of polyphase

machinery operating from unbalanced voltage sources. Two hours lecture. Second semester.
Prerequisite: E. E. 127 Two Units.

142. Electrical Illumination. Spectral characteristics of the more common types of electrical light sources are discussed and specification bases established. Problems are solved for the selection and position of lighting systems to provide specified levels of illumination. Wiring and control systems are developed for handling the electric lighting power in conformity with Underwriters Laboratories code. Two hours lecture. Second semester.
Prerequisite: E. E. 125. Two Units.

144. Power Transmission Lines. The behavior of relatively long lines at power frequencies is analyzed. Power transmission limitations and circle diagrams are developed. Effects of power factor correction equipment on current and voltage distribution are treated. The characteristics of these lines that must be considered in carrier current communications and relaying systems are discussed. Two hours lecture. Second semester.
Prerequisites: E. E. 127 and E. E. 131. Two Units.

146. Ultra-High Frequency Techniques. Characteristics of tubes suitable for generating and amplifying ultra-high frequency power Some limitations of U-H-F receivers. Principle features of transmission lines, wave guides and resonant cavities at these frequencies. Three hours lecture. Second semester.
Prerequisites: E. E. 127 and 131 and concurrent registration in E. E. 136. Three Units.

170. Thesis. Investigation of an approved electrical engineering problem and preparation of a suitable thesis covering the investigation. Conferences as required.
Prerequisite: Senior standing in Electrical Engineering.
Two units.

171. Electrical Design. Design of magnetic circuits and associated electric circuits in machines. Calculations of heat generation and dissipation rates in electrical apparatus. Selection of materials for desired electric, magnetic and thermal behavior. Six hours lecture and computation. First semester.
Prerequisite: E. E. 126. Two Units.

172. Power Generation and Distribution Problems. Principles of engineering economy applied to selection of component equipment for power operation and utilization. Survey of typical capital and operating costs of steam and hydro-electric generating stations. Economic selection of conductor size. Discussion of load between available generating units and between available services. Location of load centers, power plant sites. Simple short circuit calculations on systems and applications of circuit breakers and relays for system protection. Six hours lecture and computation. Second semester.
Prerequisite: E. E. 126. Two Units.

175. Electric Circuits Laboratory. Experimental study of basic circuit principles developed in E. E. 125. Opportunity is afforded for exercise in laboratory techniques. Three hours laboratory. First semester.
Prerequisite: To accompany E. E. 125 One unit.

176. Electric Circuits and Machinery Laboratory. Experimental study of balanced polyphase loads, operating characteristics

of transformers, induction motors, synchronous motors, direct current generators and direct current motors. Three hours laboratory. Second semester.

Prerequisite to accompany E. E. 126. One Unit.

177. Advanced Electric Circuits and Machinery Laboratory. Continuation of E. E. 176, to treat unbalanced polyphase loads, special tests on direct current machines, the amplidyne generator, and further study of alternating current machines. Three hours laboratory. First semester.

Prerequisite: To acompany E. E. 127 One Unit.

178. Advanced Alternating Current Machinery Laboratory. Laboratory tests and computations on alternating current power equipment characteristics as treated in E. E. 128. Three hours laboratory. Second semester.

Prerequisite: E. E. 177. One Unit.

181. Electronics Laboratory. Experimental study of tube characteristics, rectifier circuits, thyratron control systems, cathode-ray oscillograph, some amplifiers and oscillators. Three hours laboratory. First semester.

Prerequisite: To accompany E. E. 131 One Unit.

182. Advanced Electronics Laboratory. Continuation of E. E. 181 to include feedback amplifiers, radio-frequency voltage and power amplifiers, modulation systems, and detector characteristics. Three hours laboratory. Second semester.

Prerequisite: To accompany E. E. 132. One Unit.

185. Elements of Electrical Engineering Laboratory. Experimental study of some simple alternating current circuits, and tests to demonstrate operating characteristics of alternating and direct current apparatus. Three hours. First semester.

Prerequisite: To accompany 135. One Unit.

188. Electric Transients Laboratory. Experimental verification, using the electromagnetic oscillograph, of transient behavior of circuits as treated in E. E. 138. Three hours laboratory. Second semester.

Prerequisite: To acompany E. E. 138. One Unit.

ENGLISH

Students who wish to make English their major subject must have completed all the prescribed English courses of the lower division with at least a grade of C.

The major program must include 24 units of upper division English courses. A grade of C must be maintained in all courses of the major, and, at the end of the senior year, each student must pass a comprehensive final examination.

Subject A Course. A sub-collegiate writing course for those who fail to pass composition placement tests. Grammar, spelling, punctuation, capitalization and the elements of rhetoric are reviewed and drills given. Two hours until the course is passed. No college credit.

1. Freshman Composition. A study of the formal idiom required in the expository rhetoric of undergraduate academic reading and writing. Course assignments oblige use of the Library and stress academic form. Three hours. First semester. Three units.

2. Freshman Composition. To the study of exposition is added more emphasis on description, narration, argumentation, persuasion

and figurative language as these appear in literary compositions. Appropriate readings. Three hours. Second semester. Three units.

3. Early English Literature. A study of the beginnings of English literature, including the Saxon, Norman and Early English periods. Lectures and recitations. Three hours. First semester. Three units.

4. Elizabethan Literature. A study of the more prominent writers during the Tudor and Stuart reigns, with special emphasis on the Elizabethan period. Lectures and recitations. Three hours. Second semester. Three units.

5. Argumentation and Oratory. Invention, arrangement and development of thought; a course presenting the principles of reasoning and persuasion. Critical analysis, discussion and oral presentation of specimens of oratorical composition, classical and modern. Three hours. One semester. Three units.

6. Introduction to the Study of Poetry. Its nature and kinds, especially the epic, the lyric and the drama. Practice in verse composition in imitation of authors read. Three hours. One semester. Three units.

7. Survey of Literature. An introduction to upper division literature courses. The history of English literature from the Anglo-Saxon beginnings to the Romantic Movement. Required readings in the authors studied. Three hours. First semester. Three units.

8. Survey of Literature. The history of English literature from the Romantic Movement to the present. Required readings in the authors studied. Three hours. Second semester. Three units.

Courses 11-14, are designed for students in the College of Engineering.

11. Composition and Rhetoric. Lectures and written assignments. Exposition; the unity and coherence of the whole composition, with a thorough review of the paragraph, the sentence and the right choice of words. Course assignments oblige use of the Library and stress academic form. Three hours. First semester. Three units.

12. Composition and Rhetoric. Continuation of English 11. The characteristics of description and narration. Expository description; description in narrative pieces. Simple narrative. Appropriate readings. Three hours. Second semester. Three units.

14. Technical English. A study of clear, concise statements such as are used in specifications, contracts and engineering reports. Three hours lecture.

Prerequisite: Junior standing in Engineering. Three units.

21. Journalism. News writing and reporting. A study of news values and sources of news; structure and style in news stories; feature writing. Lectures and discussions. Practice and laboratory work. Two hours. Second semester. Two units.

101. The Essay. An advanced course in the study of the essay. Its nature and kinds. Forerunners of the essay. The essay in English with readings in representative English and American essayists down to the present. Three hours. One semester. Three units.

102. Fiction. The nature and kinds of fiction, illustrated by ancient and modern forms in verse and prose. Plot, setting, characters. Special emphasis on modern prose forms. The novel and the

short story with appropriate readings. Three hours. One semester. Three units.

103. Shakespeare. A study of the historical background and the influence of Shakespeare in the development of English dramatic literature. Intensive study of at least four plays with further plays assigned for more rapid reading. (Required of all English Majors.) Three hours. One semester. Three units.

104. Milton. His background and spirit. Contrast with Dante, Virgil and Homer. Selections from his prose. His principal minor poems. Comus. Paradise Lost. Three hours. One semester. Three units.

105. Chaucer. Chaucer's medieval background. Dawning influence of the Renaissance. Relation to later English literature. Diction. Versification. Literary characteristics. Readings from Canterbury Tales and from earlier and later minor poems. Three hours. One semester. Three units.

106. Nineteenth Century Poetry. An advanced course based on the study and interpretations of selections from the principal English poets of the nineteenth century. Three hours. One semester. Three units.

107. Nineteenth Century Prose. An intensive study of a select number of English nineteenth century writers of non-fictional prose. Their subject matter, mental traits and qualities of style. Three hours. One semester. Three units.

108. American Literature. Its historical development briefly reviewed. Points of comparison and contrast with other literatures. Readings from the principal American poets and prose writers. Three hours. One semester. Three units.

109. Browning. Dramatic lyrics; dramatic romances; the dramatic monologue; Pippa Passes; The Ring and the Book. Three hours lecture. Three units.

110. Shakespeare. An extensive reading course in the plays of Shakespeare. A rapid survey of the poet's dramatic work. (For students not majoring in English.) Lectures and assigned readings. Three units.

111. Tennyson. The Lady of Shallot and other poems; English Idyls and other poems; In Memoriam; The Princess; The Idylls of the King. Three hours lecture. Three units.

112. The Neo-Classical Period. The ages of Dryden, Pope, and Johnson, down to and including the Pre-Romanticists, 1660-1798. Three houurs. One semester. Three units.

113. The Romantic and Victorian Writers. A study of a select number of English 19th century writers of poetry and of non-fictional prose. Their subject matter, mental traits, and qualities of style. Three hours. One semester. Three units.

114. Creative Writing. A workshop course in the technique of writing current types of imaginative prose. Three hours. One semester. Three units.

FRENCH

1. Elementary French. In this course the student is carefully drilled in elementary grammar up to the irregular verbs, attention also being given to acquiring a vocabulary of the more common

words. Three hours. First semester. Three units.

2. Elementary French. A continuation of French 1. Special attention is given to the more important irregular verbs, the memorizing of words, and translation of French into English and vice versa. Three hours. Second semester. Three units.

3. Intermediate French. A thorough review of grammar and syntax. The object of this course is to acquaint the student with the general vocabulary and enable him to read the more simple French writers. Three hours. First semester.
Prerequisite: French 2. Three Units.

4. Intermediate French. This course continues the work begun in French 3. Regular exercises are given in written work, and copious reading is made from the standard works in order to fit the student for professional reading. Three hours. Second semester.
Three units.

5-6. Advanced Composition and Reading. Compositions and sight reading; oral and written reports in French; conversation; survey of French literature. This course is conducted almost entirely in French. Three hours. Both semesters. **Six units.**

GENERAL ENGINEERING

1. Engineering Drawing. Lettering. Use of instruments. Orthographic projections. Point, line, and plane problems. Six hours lecture and drafting. First semester. Two units.

2. Engineering Drawing. Development of surfaces. Intersections of surfaces. Sections and conventions. Dimensioning. Fasteners. Working detail drawings. A. S. A. Drafting Room Standards. Six hours lecture and drafting. Second semester.
Prerequisite: G. E. 1. Two units.

3. Orientation. Lectures and assigned reading on How to Study, Definitions of Engineering, kinds of engineering, biographies, slide rule and problems. One hour lecture. First semester.
One half unit.

4. Orientation. Continuation of G. E. 3. One hour lecture. Second semester.
Prerequisite: G. E. 3. One half unit.

5. Materials and Processes of Construction. The manufacture, properties and uses of modern materials of engineering construction. Two hours lecture. First semester. **Two units.**

6. Technical Mechanics. Statics and kinematics. Four hours lecture. Second semester.
Prerequisite: Math. 24. **Four units.**

15. Mechanics. (Statics of Rigid Bodies). Resultants of force systems. Equilibrium of force systems. Graphical and algebraic solutions of forces acting on trusses and other structures. Friction. Three hours lecture. First semester. Three units.

16. Mechanics. (Strength of Materials). Physical properties of materials. Strength of machine and structural members. Deformation of machine and structural members under load. Four hours lecture. Second semester.
Prerequisite: G. E. 15. Four units.

65. Statics Laboratory. Experimental study of forces, couples, and resultants of force systems. Centroids. Centers of pressure. Three hours laboratory. First semester.
Prerequisite: To accompany G. E. 15. One unit.

66. Materials Laboratory. Experimental study of the physical properties of engineering materials. Laboratory technique in accordance with A. S. T. M. testing methods. Three hours laboratory. Second semester.
Prerequisite: To accompany G. E. 16. One unit.

101. Technical Mechanics. Kinetics. Three hours lecture. First semester.
Prerequisite: G. E. 6. Three units.

103. Mechanics of Materials. Elastic and ultimate resistance of materials. Resistance to load and deformation of members in structures and machines. Three hours lecture. First semester.
Prerequisite: G. E. 6. Three units.

104. Fluid Mechanics. Fundamental principles of hydrostatics and hydrodynamics applied to the pressure, flow and energy of water, air and other fluids. Three hours lecture. Second semester.
Prerequisite: G. E. 101. Three units.

105. Management Engineering. Industrial organization and management. Time and motion study. Wage systems. Cost accounting. Personnel work. Engineering economics. The financial structure. Public control of business. Taxation. The problem of investment. Valuation. Estimating. Engineering reports. Three hours lecture. First semester.
Prerequisite: Junior standing. Three units.

106. Management Engineering. Continuation of G. E. 105. Three hours lecture. Second semester.
Prerequisite: G. E. 105. Three units.

108 Seminar. Reading and reports from current Engineering literature. Effective delivery of reports. One hour lecture and reports. Second semester.
Prerequisite: Senior standing. One unit.

111. Materials Testing Laboratory. Testing of engineering materials to determine their properties and conformity with Standards of the American Society for Testing Materials. Three hours laboratory. First semester.
Prerequisite: To accompany G. E. 103. One unit.

112. Hydraulics Laboratory. Experimental study of the pressure, flow and energy of fluids. Three hours laboratory. Second semester.
Prerequisite: To accompany G. E. 104. One Unit.

115. Mechanics. (Dynamics of Rigid Bodies). Displacement Velocity. Acceleration. Force. Mass. The work-energy relationship. The impulse-momentum relationship. Two hours lecture. First semester.
Prerequisites: G. E. 16 and Math. 34. Two units.

116. Mechanics. (Mechanics of Fluids). Properties of fluids. Pressure. Dynamics of Fliud Flow. Hydrokinetics. Flow in pipes and channels. Dynamic forces. Unsteady flow. Impulse and reaction turbines. Two hours lecture. Second semester.
Prerequisite: G. E. 115. Two units.

117. Materials and Processes. The manufacture, properties and uses of modern engineering materials. Two hours lecture. First semester. Two units.

121. Engineering Economics. Definition of economics. Basic concepts. Business units. Money and money systems. Investments. Labor relations. The economics of collectivism. Engineering economy studies. Present worth. Capitaliezd cost. Depreciation. Engineering reports and budgets. Contracts and specifications. Three lecture hours. First semester. Three units.

122. Engineering Economics. Continuation of G. E. 211. Three hours lecture. Second semester.
Prerequisite: G. E. 121. Three Units.

165. Dynamics Laboratory. Experimental study of moments of inertia, simple harmonic motion, gears and cams, relative motion, acceleration in rectilinear translation, rotation, and pland motion. Three hours laboratory. First semester.
Prerequisite: To accompany G. E. 115. One Unit.

166. Fluids Laboratory. Experimental study of the pressure, flow and energy of fluids. Laboratory techniques in the use of orifice meters, Venturi meters, and other metering devices. Three hours laboraory. t Second semester.
Prerequisite: To accompany G. E. 116. One Unit.

GEOLOGY

1. General Geology. A popular course of visual instruction to give the student an intelligent appreciation of the physiographic relief features of the earth and an insight into the probable conditions of the origin and formation of various geologic phenomena. Lectures, stereopticon projections, and supervised discussion. Two hours. One semester. Two units.

2. Historical Geology. Visual instruction regarding theories of earth formation. Paleontology. Special study of fossils with access to large museum. Lectures on geologic aspects of evolution. Two hours. One semester. Two units.

33. Engineering Geology. A course in dynamical, structural and historical Geology. Particular attention is paid to structural Geology and the influences of constructive and engineering conditions. The student is made familiar with different stones by illustrating each recitation with specimens of the particular rocks treated, as well as their adaptability in construction, method of occurrence, etc. Ries and Watson: Engineering Geology. Two hours lecture. First semester. Two units.

34. Mineralogy. A course in Mineralogy with access to a large collection of specimens. Determination of unlabeled specimens. Crystallography. Blowpipe analysis. Includes a short course in Metallurgy. Iron ores and production of iron and steel. Percentage and effect of sulphur, silicon manganese and carbon in iron and steel. Coals, coke, carbons and ash. Two hours lecture. Second semester.
Prerequisite: Geology 1. Two units.

101. Engineering Geology. The study of geology as it applies to the engineer in preliminary and exploration work for foundations of dams, bridges and buildings. Materials suitable for engineering structures. Erosion and silting of surface waters. Structural fea-

tures of the earth's crust. Laboratory work with the common minerals and rocks of concern to the engineer, also their identification. Two hours lecture, three hours laboratory. First semester.
Three units.

GERMAN

1. Elementary German. Elements of German grammar. Drill in pronunciation. Vocabulary. Three hours. First semester.
Three units.

2. Elementary German. A continuation of German 1. Syntax. Oral and written exercises. Reading from more simple German prose. Three hours. Second semester. Three units.

3. Intermediate German. Review of syntax. Translation. Oral and written exercises. Reading of somewhat difficult German prose. Three hours. First semester.
Prerequisite: German 2. Three Units.

4. Intermediate German. Reading, written and oral exercises. This course aims at preparing the student to read the more difficult German writers. Three hours. Second semester.
Prerequisite: German 3. Three Units.

5-6. Advanced Composition and Reading. Composition; sight reading; oral and written reports in German; conversation; historical survey of German literature. This course is conducted almost entirely in German. Three hours. Both semesters. Six units.

GREEK

1. Elementary Greek. The course is intended for those who enter without Greek. Grammar; simple prose selections; composition. Three hours. First semester. Three units.

2. Elementary Greek. A continuation of Greek 1. Readings from Xenophon: Anabasis, with prose composition based on Xenophon. Three hours. Second semester. Three units.

3. Intermediate Greek. A continuation of the grammar, with readings and prose composition. Selected portions of the Iliad or Odyssey; Homeric Dialect; outline of Greek epic poetry. Three hours. First semester. Three units.

4. Intermediate Greek. A continuation of Greek 3, with special emphasis on sight reading and advanced prose composition. Three hours. Second semester. Three units.

5. Demosthenes. A study of selected Olynthiac, Philippic orations or the speech on the Crown as models of oratorical art; analysis, discussion and criticism. Three hours. One semester.
Three units.

6. Homer and Sophocles. A study of the Iliad and Odyssey of Homer; Oedipus Tyrannus of Sophocles. Three hours. One semester. Three units.

7. A Study of Selected Greek Lyrics. Three hours. One semester. Three units.

8. Plato. Readings from Plato. An analysis, discussion and criticism of his works. Three hours. One semester. Three units.

11. Homer. A study of the Greek Epic in the Iliad or Odyssey, with selected readings. Three hours. One semester. Three units.

12. Sophocles. Reading of the Oedipus Tyrannus or Antigone, with a study of Greek dramatic art and dramatic conventions. Three hours. One semester. Three units.

101. Historical Survey of Greek Literature. Special emphasis on its natural growth and reflection of Greek history. Influence on Latin and Modern Literature. Three hours. One semester. Three units.

102. Greek Historical Prose. Selections from Herodotus and Thucydides. Comparison of styles and critical spirit. Three hours. One semester. Three units.

103. Aeschylus and Sophocles. A tragedy of each with special emphasis on tragic structure and metric. Three hours. One semester. Three units.

104. Euripides and Aristophanes. One play of each (probably "Medea" and "Frogs"). Attention especially to Aristophanes' criticism of Euripides, and the relation of the two men to their times. Three hours. One semester. Three units.

105. Comparative Drama. A course supposing and supplementing Greek 103-104. Special study of the evolution of dialogue, chorus and dramatic character. Lectures on the Greek Theatre and its conventions. Two hours. One semester. Two units.

106. Lysias, Isocrates. Selected speeches. A study of the growth of Attic prose. Three hours. One semester.
Prerequisite: Greek 5. Three Units.

107. St. John Chrysostrom, St. Basil. Selected orations with special reference to rhetorical style. Comparison with the Attic orators. Three hours. One semester. Three units.

110. Greek Style. Advanced composition involving exercises along essay and oratorical lines. Two hours. One semester. Two units.

HISTORY

Students who wish to make History their major subject, besides completing the other required courses of the lower division, must pass the courses in History 1-2 and Political Science 1-2 with at least a grade of C.

The major program must include 24 units of upper division History courses. A grade of C must be maintained in all courses of the major and, at the end of the senior year, each student must pass a comprehensive final examination.

1-2. History of Modern Europe. A general survey of European civilization from the beginning of the sixteenth century to the present time. Political activities in the various countries. Nationalism. Protestantism and the religious wars. Later irreligious tendencies and the French Revolution. Social factors of the nineteenth century. The first half-year's work extends to the Congress of Vienna. The second half-year's work extends to the present time. Three hours. Both semesters. Six units.

3-4. Survey of Western Civilization. A background course, intending to sketch in broad outline the principle historical factors at work in forming our European culture. Required readings. Three hours. Two semesters. Two units.

101-102. The Renaissance and the Reformation. A critical study of the revival of the Old and the birth of the New Learning. Criticism of existing institutions. Rejection of the authority of the Church. The influence of this period on Italy, Germany and France. Three hours. Both semesters. Six units.

103. Europe in the Seventeenth and Eighteenth Centuries. The rise and fall of Absolutism. Development and consolidation of the national states. The growth of colonial empires. The decline of Spanish and Dutch power. The rise of England and France and the struggle for world power. Three hours. One semester. Three units.

104. The Revolutionary Period in History. A survey of the revolutionary movements in Europe from the French Revolution of 1870. The anti-Clerical movement. The effects of the Industrial Revolution. The gradual spread of the spirit of democracy. Three hours. One semester. Three units.

105-106. History of the United States. A general course dealing with the different forms of government under which the colonists were ruled. The independence of the colonists in political affairs. The efforts of the colonists to unite for mutual political protection. The protests against coercion. The Declaration of Independence. The Articles of Confederation. The Constitution. The political history of the United States. Three hours. Both semesters. Six units.

107. Europe since 1870. A study of the gradual completion of political democracy. Its application to meet social needs. Its entanglements with nationalist and imperialistic sentiment. The struggle for paramount influence in the Balkan States. Various causes of the World War. A post-war survey of the political, social and economic conditions in Europe. Three hours. One semester. Three units.

108. England under the Tudors and the Stuarts, 1485-1689. The political situation at the close of the War of the Roses. The efforts of the throne to dominate over all political, social and religious institutions. The political theories of the Stuarts. The Puritan Revolution. The civil war. The Cromwellian Period. The policy of restoration. The revolution of 1688. Three hours. One semester. Three units.

109. Greek History. Homeric Age to the Fall of Corinth. Three hours. One semester. Three units.

110. Roman History. From its beginning to Constantine. Three hours. One semester. Three units.

111. Mediæval History. Survey from the Edict of Milan to the Discovery of America. Three hours. One semester. Three units.

114. Causes of the Present War. The underlying causes of all wars, economic rivalry, imperialism, nationalism. The failure of the Versailles settlement and the League of Nations. The effect of reparations and war debts. The rise of revisionist regimes in Japan, Italy and Germany. Direct steps leading to war, 1931-1939. Three hours. One semester. Three units.

120. Historical Method and Bibliography. Required conferences in the first semester of junior year on historical research and bibliography for all students whose major is history. Use of library emphasized. Hours of conferences by arrangement.

121. Individual Conferences and Assignments. Required for all Seniors whose major is history during the second semester. Assigned reading and direction for the comprehensive examination and the senior thesis.

131. Colonial Era in the Americas. The aboriginal world. The course of exploration and conquest. Establishment of European cultures. The role of the Missions in frontier life. The colonial systems. Underlying causes of the revolutionary movements in North and South America. Three hours. One semester. Three units.

132. The American Nations. The organization of the new, self-governing nations, particularly in Latin America. Their economic and political problems. Their national characteristics. Inter American relations. The Monroe Doctrine, Pan Americanism and the Good Neighbor Policy. Three hours. One semester. Three units.

ITALIAN

1. Elementary Italian. Elements of Italian Grammar. Drill in Pronunciation. Vocabulary. Three hours. First semester. Three units.

2. Elementary Italian. A continuation of Italian 1. Syntax; oral and written exercises. Reading from simpler Italian prose. Three hours. Second semester. Three units.

3. Intermediate Italian. Review of grammar and syntax. Translation. Oral and written exercises. Reading of somewhat difficult Italian prose. Three hours. First semester.
Prerequisite: Italian 2. Three Units

4. Intermediate Italian. Reading, written and oral exercises. This course aims at preparing the student to read the more difficult Italian writers. Three hours. Second semester.
Prerequisite: Italian 3. Three Units.

5-6. Italian Literature. A study of special periods and writers in Italian literature, with emphasis on their literary qualities. The development of fluency in Italian composition and pronunciation. An easy reading, writing and conversational knowledge of Italian is presumed. Three hours. Both semesters.
Prerequisite: Italian 4. Six units

LATIN

A-B. Elementary Latin. Beginning Latin courses for students who have had no previous study in Latin. These courses are equivalent to the first two years of high school Latin. Three hours. Each semester. Six units.

C-D. Intermediate Latin. Courses equivalent to the last two years of high school Latin. Three hours. Each semester. Six units.
Pre-requisite: two years of high school Latin or Latin B.

1. Cicero. The orations studied as methods of oratorical art;

rapid reading, analysis, discussion, criticism. Latin composition based on special text and matter read in class. Three hours. First semester.

Prerequisite: High School Latin: 4 years. Three Units.

2. The Epic—The Aeneid. After reading books VII-XII, the poem will be studied as a whole, special attention being given to the sources, to the epic technique and literary art of Virgil and to the tracing of his influence in the literature of the world. Narration and descriptive composition based chiefly on the text of the Aeneid and implying a discrimination of the vocabularly and syntax of prose and verse. Students will write three compositions weekly. Three hours. Second semester.

Prerequisite: Latin 1. Three Units.

3. The Latin Historians. Copious reading in Sallust, Curtius, Pliny and Livy, with critical consideration of the historical works of these writers, and collateral reading directed to reach an appreciation of their place in Latin literature. Latin composition based on the Latin historians. Three hours. First semester

Prerequisite: Latin 2. Three Units.

4. The Lyric and Elegiac Poets. The Odes of Horace, books I-IV, with selections from the "Ars Poetica," and the elegies of Ovid and Propertius, will be read and carefully studied. Such phases of Roman life as are suggested will be the subject of collateral reading under the direction of the professor. Latin composition. Students will be expected to show facility and elegance of diction in their written work. Three hours. Second semester.

Prerequisite: Latin 3. Three Units.

6. Cicero as an Essayist. Cicero's charm as an essayist; discussion of the several types of his essays; reading of **De Amicitia, De Senectute,** and parts of **De Natura Deorum.** Three hours. One semester. Three units.

7. Special Latin. A rapid review of elementary Latin, including grammar, composition and rapid reading of easy passages. Intended for students with an amount of High School Latin insufficient to enter Latin 1. Three hours. Both semesters.

Prerequisite: High School Latin, 2 years. Six Units.

11. The Odes and Epodes of Horace. Selections including the greater part of Horace's lyrical works, studied with relation to their background, literary art and metrical form. Three hours. One semester. Three units.

12. The Elegiac Poets. Selections and studies in Ovid, Propertius and Tibullus. Origin and development of the elegiac form. Three hours. One semester. Three units.

101. The Drama. A critical study of the Latin dramatists: Seneca, Plautus, Terence. Three hours. One semester. Three units.

102. Historical Survey of Latin Literature. Special emphasis on its influence upon Modern Literature. Three hours. One semester. Three units.

103. Tacitus. A study of the qualities of the style of Tacitus with some consideration of his characteristics as an historian. Two hours. One semester. Two units.

104. Virgil. The earlier works, particularly the Eclogues and Georgics. Consideration of the character of Virgil through his ideas and aims. Two hours. One semester. Two units.

105. Christian Poetry. From its beginnings to the fourteenth century. Two hours. One semester. Two units.

106. Patristic Latin. A study of the variations from the Latin of the Augustan and Silver Ages as shown in the Fathers of the Church. Two hours. One semester. Two units.

107. Horace's Satires and Epistles. Characteristics of the Roman Satire, Horace's philosophy of life and of literature. Two hours. One semester. Two units.

108. Cicero. The Tusculan Disputations and Somnium. Reading of the entire work, with attention to the style of Cicero as a didactic writer and to his philosophy. Two hours. One semester. Two units.

109. Quintilian. Institutio Oratoria. Quintilian as teacher and rhetorician. Two hours. One semester. Two units.

110. Seneca. Selections from the essays and epistles; Seneca the moralist compared with Cicero. Seneca's style. Two hours. One semester. Two units.

111. Pliny The Younger. Selection from the letters as groundwork for the study of Roman life under Nerva and Trajan. Two hours. One semester. Two units.

112. Medieval Latin. The Latin of the Middle Ages in relation to the Classical and to the formation of the modern Romanic languages. Lectures and readings. Two hours. One semester. Two units.

113. Latin Style. Advanced composition in the essay and oratorical styles. Analysis of the periodic structure and amplification. The chria and 'declamatio'. Work to be done under the direction of the professor. Two hours. Two semesters. Four units.

114. Latin Verse Composition. Prosody and verse forms. Original compositions in lyric, distich and hexameter verses. Work to be done under the direction of the professor. Two hours. One semester. Two units.

115. Latin Conversation. Instruction in the technique of Latin conversation. Opportunity will be given to select groups for daily practice in oral composition. Examinations are conducted orally. Two hours for four semesters. One unit per semester.

LAW

Courses 1-4 are limited to students registered in the College of Business Administration.

1. **Contracts.** Elements of a contract; parties; consideration; illegal and void contracts; construction; verbal and written contracts; Statute of Frauds; termination; breach; damages. Two hours. First semester. Two units.

2. **Negotiable Instruments, Sales.** Bills, notes, drafts and checks; acceptance of drafts; certified checks; rights and liabilities of endorsers; presentment; notice of dishonor; protest. **Sales:** the

contract of sale; immediate and future sales; rights and duties of consignee, consignor and carrier; stoppage and loss in transit; setting aside sales; warranties. Two hours. Second semester.
Two units.

3. Agency, Bailments and Carriers. Who may be agents and how appointed; rights and duties of agents and principals in reference to each other and to third parties; termination. **Bailments:** nature and classification; innkeepers. Common carriers, carriers and passengers; of goods, telegraph and telephone companies. Three hours. First semester. Three units.

4. Partnerships and Corporations, Bankruptcy. Articles of copartnership; rights of partners against each other; rights of creditors against firm and partners; kind of partners; termination, liquidation of assets. Corporations: charter and by-laws; stockholders' and directors' meetings; forms of corporate stock; elections; ultra vires acts; directors' and stockholders' liabilities; rights of creditors; dissolution. **Bankruptcy:** Who may become bankrupts; exemptions; duties; compositions; discharge; offenses against bankruptcy law; trustees and referees; preferred creditors. Three hours. Second semester. Three units.

91. Business Law. A brief course in Contracts, Sales, Negotiable Instruments, Real Estate, Partnership, Corporations and such other subjects as may be selected. This course is designed for students in the College of Engineering. One hour lecture. Second semester. One unit.

101. Introduction to Law. The development of the common law in England and the United States. Spirit of the common law, the nature of judicial process, the doctrine of stare decisis and its proper application. The reasons for the case method in the study of law, the proper use of case books. One hour lecture. One semester. One unit.

Professional Courses

First Year

105. Contracts I. Offer and acceptance, consideration, assignments, joint contracts, joint and several contracts, conditions, third party beneficiary, breach. Three hours. Two semesters. Six units.

107. Criminal Law and Procedure. Jurisdiction, procedure, elements of criminal liability, various crimes, criminal intent, malice. Three hours. One semester. Three units.

109. Property I. Ownership, legal title, equitable title, possession, fixtures, emblements, introduction to real property law, adverse possession, deeds, uses. Three hours. One semester. Three units.

111. Agency. Nature of agency relation, distinguished from other relations, rights of third persons against principal, against agent, rights and duties of principal and agent inter se, liability of principal for acts of agent in contract, in tort, liability of principal for acts of independent contractor. Two hours. One semester
Two units.

112. Torts. Negligence, intentional harms, libel and slander, causation, contributory negligence, last clear chance doctrine. Three hours. Two semesters. Six units.

115. Common Law Procedure. Early forms of action, various pleas at Common Law, importance in modern pleading. Two hours. One semester. Two units.

Second and Third Years

203. California Practice. Pleading and practice in California. Two hours. One semester. Two units.

204. Code Procedure. Provisions of California Codes. Two hours. One semester. Two units.

206. Conflict of Laws. Status, real property rights, rights in personality, nature of domicile, domicile distinguished from nationality, administration of estates. Two hours. Two semesters. Four units.

207. Constitutional Law. Equal protection of laws, due process of law, impairment of contract, separation of powers, theories of constitutional interpretation, full faith and credit clause, interstate commerce clause, the three branches of government, states' rights. Three hours. Two semesters. Six units.

208. Damages. Contracts and torts. Two hours. One semester. Two units.

210. Equity. Origin and nature of equity jurisdiction, jurisdiction in personam and in rem, extra-territorial effects of equity decrees, specific reparation for torts, specific performance of contracts, injunctive relief, nature of so-called equitable defenses, bills of interpleader, bills to quiet title, mutuality of performance and mutuality of remedy distinguished, equitable servitudes. Three hours. Two semesters. Six units.

211. Evidence. Questions of law and fact, burden of proof, witnesses, hearsay rule, documentary original rule, res gestae, admissions, confessions, opinion rule so-called, rationalization of rules of evidence. Three hours. Two semesters. Six units.

215. Negotiable Instruments. Promissory notes, bills of exchange, checks, Uniform Negotiable Instruments Law. Two hours. One semester. Two units.

216 Partnership. Nature of relation, rights and obligations as to third persons, rights and obligations inter se, creation, management and dissolution. Two hours. One semester. Two units.

217. Corporations. Corporate entity, de facto corporations, rights of stockholders, relations of directors to corporations, limitations upon powers of directors, corporate stocks, bonds, by-laws, Three hours. Two semesters. Six units.

218. Property II. Real property, covenants running with land, title, boundaries, future interests. Three hours. Two semesters. Six units.

219. Sales. Uniform Sales Act. Two hours. One semester. Two units.

220. Trusts. Nature of trust relation, rights of cestui qui trust, administration of trust, resulting trust, constructive trust, creation and termination of trust, nature of trustee's title. Three hours. One semester. Three units.

222. Wills and Administration. Probate, distribution of estate, requirements for valid will, execution, revocation and altera-

tion of will, distinction between various types of legacies. Two hours. One semester. Two units.

224. Suretyship and Mortgages. Surety relation, mortgagor and mortgagee. Two hours. One semester. Two units.

225. Domestic Relations and Community Property. Marriage, divorce, marital property. Two hours. One semester. Two units.

226. Contracts II. Excuses for non-performance, impossibility, mistake, illegality, damages for breach of contract, remedies for breach, rescission, specific performance, restitution, quasi-contracts. Two hours. One semester. Two units.

227. Taxation. Power to tax; jurisdiction to tax; taxation of persons and property; inheritance taxes; State and Federal taxes; remedies. Three hours. One semester. Three units.

In addition to the above courses, a course in accountancy will be required of all students registered in the College of Law. This course has been specifically designed to meet the needs of the law student in view of the accounting problems he may reasonably expect to encounter in the subsequent practice of law.

Econ. 30A-B. Survey of Accounting. This course is designed to meet the needs of students whose major interest is the practice of law. To that end the phases of accounting treated are those which involve a consideration of partnerships, corporations, ventures, syndicates, estates, trusts, and the problems involving asset valuation in public utility rate making cases. Two hours lecture. Both semesters. Four units.

All students taking Law are required to attend without credit all sessions of the Moot Court and all special lectures given during the scholastic year.

MATHEMATICS

A-B. Mathematics Review. A review of algebra and trigonometry. Designed primarily for engineering students who do not qualify for the regular first year engineering mathematics. No credit towards graduation is given for these courses.

1. Algebra. Review of the fundamental operations; exponents; linear and quadratic equations; logarithms; progressions; the binomial theorem. Three hours. One semester Three units.

2. Trigonometry. The generalized definitions of the trigonometric functions for any angle; inverse functions; functions of the sum and difference of two angles; of multiple angles; of half angles; trigonometric identities and equations; graphs of the trigonometric functions; solution of right and oblique triangles. Three hours. One semester. Three units.

Prerequisite: Math. 1.

6. Analytic Geometry. Loci and their relations; graphs of functions;transformation of coordinates; the straight line; the conic sections; polar coordinates; parametric equations. Three hours. One semester. Three units.

Prerequisite: Math. 2.

7. Calculus. Fundamental concepts of variables, functions, limits, derivatives and differentials; differentiation of the elementary

algebraic and transcendental functions; application to maxima and minima; successive differentiation and its application to curve plotting; the derivative as a rate change. Three hours. One semester. Prerequisite: Math 6. Three units.

8. Calculus. The fundamental concepts of the anti-derivative and the definite integral defined as the limit of a sum; geometric applications to lengths, areas, surfaces and volumes; applications to Physics and Mechanics. Three hours. One semester. Three units. Prerequisite: Math. 7.

9. Calculus. Space geometry; multiple integration; partial differentiation; theorem of the mean; Taylor's series; evaluation of indeterminate forms. Three hours. One semester. Three units. Prerequisite: Math. 8.

10A-10B. Fundamental Principles and Methods of Mathematics. This course is designed to meet the needs of those students who have little need for technical skill in mathematics. Comprehension of principles rather than techniques of manipulation is emphasized. The subject matter includes the nature of deductive logic; mathematics as a deductive science; a logical treatment of the number system, algebra, and selected branches of mathematics; introduction to analytic geometry and calculus. Three hours lecture. Two semesters. Six units.

15. Introduction to Mathematical Analysis. A study of the scientific method of mathematical analysis designed particularly to meet the needs of students of the College of Business Administration. Three hours lecture. One semester. Three units.

17. Algebra and Trigonometry. Review of Algebra through quadratic equations; ratio and proportion; progressions; imaginary and complex quantities; binomial theorem; variables and limits; inequalities; interpretation of results; logarithms; undetermined coefficients; development of trigonometric formulae; relations of the trigonometric functions; properties of triangles; functions of a single angle; identities and equations; practical application; functions of more than one angle; oblique triangles; the Argand diagram; DeMoivre's Theorem; spherical trigonometry. Five hours. One semester. Five units.

18. Trigonometry and Analytic Geometry. Completion of the work of Math. 17. Graphs; loci and equations; the straight line; the conics; parametric equations; transformation of coordinates; polar coordinates; higher plane curves; solid analytic geometry; spherical and cylindrical coordinates. Four hours. One semester. Four units. Pre-requisite: Math. 17.

24. Calculus. Fundamental formulae and principles for differential and integral calculus; maxima and minima; curvature; surfaces; volumes; intermediate forms; envelopes; series; expansion; forms of integration; practical applications. Four hours. One semester. Four units.
Prerequisite: Math. 18.

25. Calculus. Continuation of Math. 24. Four hours. One semester. Four Units.

31. Introductory Analysis. Coordinate systems. Graphs. Functions. Systems of linear equations. Quadratic equations. Polar

coordinates and the trigonometric functions. The straight line. Loci. The conic sections. Four hours lecture, one hour review. First semester. Four units.

32. Introductory Analysis. Transformation of coordinates. Oblique triangles. Exponents. Logarithms. Complex numbers. The derivative and its applications. Theory of equations. Empirical equations. Solid analytic geometry. Four hours lecture, one hour review. Second semester.

Prerequisite: Mathematics 31. Four units.

33. Calculus. Engineering applications of the derivative. The indefinite integral. The definite integral. Numerical integration. Applications of the defnite integral. First semester. Four hours lecture, one hour review.

Prerequisite: Math. 32. Four units.

34. Calculus. Partial differentiation. Multiple integration. Engineering applications of the multiple integral: centroids, moments of inertia, work, fluid pressure. Series. Expansion of functions. Ordinary differential equations. Second semester. Four hours lecture, one hour review.

Prerequisite: Math. 33. Four units.

116. Differential Equations. Analysis and deduction of formulae and equations used in Physics, Mechanics and engineering problems; applications of formulae and equations given in engineering problems; applications of formulae and equations given in engineering handbooks to problems; practical problems and lectures. Two hours. One semester. Two units.

Prerequisite: Math. 34.

117. Method of Least Squares. Study of the principles and methods; application to solution of physical, astronomical, engineering and other problems, especially triangulations. Two hours. One semester. Two units.

Prerequisite: Math. 34.

MECHANICAL ENGINEERING

11. Shopwork. Manufacturing processes. Machine tools. Arc and oxy-acetylene welding. Foundry. Electric wiring. Molding of plastics. Economic and scientific fabrication of parts. These processes are all performed by students and this experience is supplemented by visits to commercial shops and by moving pictures showing manufacturing processes. Three hours lecture, shop work and inspection trips. First semester. One unit.

12. Shopwork. A continuation of M. E. 11. Three hours lecture, shop work and inspection trips. Second semester.

Prerequisite: M. E. 11. One unit.

15. Mechanical Engineering Laboratory. Experimental study of such measuring devices as tachometers, pyrometers, dynamometers, calorimeters, and planimeters. Experimental measurement of such engineering values as the heating value of fuels and efficiency of engines by using these devices. One hour lecture and three hours laboratory. First semester.

Prerequisite: To accompany Physics 14 and 15. Two units.

16. Machine Drawing. Freehand sketches and working drawings of machine parts and assemblies. Jigs and fixtures. Working drawings for welded construction. Working drawings for electrical

work. Three hours drafting. Second semester.
Prerequisite: G. E. 2. One unit.

20. Machine Drawing. Freehand sketches and working drawings of machine parts and assemblies. Six hours drafting. Second semester.
Prerequisite: G. E. 2. Two units.

101. Heat Power. Fundamental laws and principles of heat generation, transfer and conversion. Various thermodynamic apparatus and cycles. Two hours lecture. First semester.
Prerequisites: Physics 14 and 15. Two units.

102. Heat Power. Continuation of M. E. 101. Two hours lecture. Second semester.
Prerequisite: M. E. 101. Two units.

103. Heat Power. Continuation of M. E. 102. Three hours lecture. First semester.
Prerequisite: M. E. 102. Three units.

104. Heat Power. Internal combustion engines. The Otto and Diesel cycles and various modifications of these cycles. Engines operating on these cycles. Four hours lecture. Second semester.
Prerequisite: M.E. 103. Four units.

106. Heating, Ventilation and Air Conditioning. Fundamental laws and principles governing the heating, ventilation and air conditioning of such structures as buildings, tunnels and subways. Heating, ventilation and air conditioning apparatus. Two hours lecture. Second semester.
Prerequisite: M. E. 103 Two units.

108. Mechanical Vibrations. The analysis of mechanical vibrations. Vibration damping and isolation. Critical speeds of shafts. Behavior of structures subjected to dynamic loading. Two hours lecture. Second semester.
Pre-requisite: M. E. 120. Two units.

110. Mechanical Engineering Laboratory. Continuation of M. E. 15. Six hours lecture and laboratory. Second semester.
Prerequisite: M. E. 15. Two units.

111. Mechanical Engineering Laboratory. Continuation of M. E. 110. An intensified study of one process or the operation of a particular type of machine. Six hours lecture and laboratory. First semester.
Prerequisite: M. E. 110. Two units.

112. Mechanical Engineering Laboratory. Time and motion study and analysis of industrial processes both in the University shops and in commercial plants. Six hours lecture, laboratory and inspection trips. Second semester.
Prerequisite: Senior standing. Two units.

115. Aerodynamics. Principles of fluid mechanics applied to airplane structures. Airfoil action, propellers, models and stability. Three hours lecture. First semester. Three units.
Prerequisite: Senior standing.

116. Airplane Structures. Structural analysis and design of airplanes. Commerce regulation for airworthiness. Three hours lecture. Second semester. Three units.
Prerequisite: M.E. 115.

120. Machine Design. Principles of kinematics, mechanics, properties of materials and shop processes applied to the design of machines. Six hours lecture, computation and drafting. Second semester.
Prerequisite: G. E. 103. Two units.

121. Machine Design. Continuation of M.E. 120. Nine hours lecture, computation and drafting. Second semester.
Prerequisite: M.E. 120. Three units.

124. Power Plant Design. Principles of engineering economy applied to the selection of power plant sites and equipment. Layout of a complete power plant. Six hours lecture, computation and drafting. Second semester.
Prerequisite: M. E. 103. Two units.

Two units.

125. Heat Power. Energy concepts. The general Energy Equation. Characteristics of gases. Enthalpy. Entropy. Reversibility. Properties of vapors and gases. Cycles for internal combustion engines. Compression and expansion of gases. Combustion and the products of combustion. Variable specific heats. Vapor processes. Vapor cycles. Steam engines. Steam generators. Steam power plant cycles. Flow of gases and vapors through nozzles. Steam turbines. Refrigeration. Air conditioning. Heat transfer. The economic problem. Load curves. Selection of type of plant. Energy rates. Three hours lecture. First semester.
Prerequisite: Physics 14 and 15. Three Units.

126. Heat Power Continuation of M. E. 125. Three hours lecture. Second semester.
Prerequisite: M. E. 125. Three Units.

127. Heat Power Continuation of M. E. 126. Two hours lecture. First semester.
Prerequisite: M. E. 126. Two Units.

128. Heat Power Continuation of M. E. 127. Two hours lecture. Second semester.
Prerequisite: M. E. 127. Two Units.

130. Heat Power. Sources of energy. Combustion Conversion of heat energy into mechanical energy. The Otto cycle. The Diesel cycle. The steam boiler. The steam engine. The steam turbine. Pumps. For civil engineering students. Three hours lecture. Second semester.
Prerequisite: Physics 14 and 15. Three units.

131. Heating, Ventilation and Air Conditioning. Fundamental laws and principles governing the heating, ventilation and air conditioning of such structures as buildings, tunnels and subways and airplanes. Heating, ventilation and air conditioning apparatus. Three hours lecture. Second semester.
Prerequisite: M. E. 126. Three Units.

132. Heating, Ventilation and Air Conditioning. Continuation of M. E. 131. Three hours lecture. Second semester.
Prerequisite: M. E. 131. Two Units.

133. Aerodynamics. Principles of fluid mechanics applied to airplane structures. Airfoil action, propellers, models and stability. Two hours lecture. First semester.
Prerequisite: Senior standing. Two units.

134. Airplane Structures. Structural analysis and design of airplanes. Commerce regulation for airworthiness. Two hours lecture. Second semester.
Prerequisite: M.E. 133. Two units.

135. Internal Combustion Engines. The internal combustion engine process. Fuels and fuel-air mixtures. Thermodynamics of internal combustion engine cycles. The Otto and Diesel cycles and various modifcations of these cycles. Engines operating on these cycles. Testing and performance. Economics of oil and gas power. Three hours lecture. First semester.
Prerequisite: M. E. 126. Three Units.

136. Internal Combustion Engines. Continuation of M. E. 135. Three hours lecture. Second semester.
Prerequisite: M. E. 135. Three Units.

137. Time Study and Job Analysis. Measurement of labor. Operation analysis. Motion study. Process charts. Laws of motion economy. Micromotion study. Film analysis procedure. Standardizing the job. Skill. Effort. Formula expression. Formula working sheets. Two hours lecture. First semester.
Prerequisite: To accompany G. E. 121. Two Units.

138. Production Control. The problem of the production of goods. Factors which aid modern productivity. Coordination of sales and manufacturing. Organization for production control. Research. Budgets. Materials. Machine replacement. Methods and standards. Planning and routing. Operation and instruction sheets. Centralized control of production. Inspection. Measures of factory performance. Three hours lecture. Second semester.
Prerequisite: G. E. 121. Three Units

139. Mechanical Vibrations. The analysis of mechanical vibrations. Vibration damping and isolation. Critical speeds of shafts. Behavior of structures subjected to dynamic loading. One hour lecture. First semester.
Prerequisite: G. E. 115 and 165. One Unit.

170. Thesis. Investigation of some engineering problem and the writing of an acceptable thesis. Conferences as required. Second semester.
Prerequisite: Senior standing in Mechanical Engineering.

175. Mechanical Engineering Laboratory. Experimental study of the flow of liquids and gases through pipes. Experimental study of the flow of heat through various media. Tests of such machines as steam engines, steam boilers, steam turbines, condensers and pumps by the use of the procedures specified in the A. S. M. E. Test codes. Three hours laboratory. First semester.
Prerequisites: M. E. 15. One unit.

176. Mechanical Engineering Laboratory. Continuation of M. E. 175. Three hours laboratory. First semester.
Prerequisite: M. E. 175. One Unit.

177. Mechanical Engineering Laboratory. Continuation of M. E. 176. Six hours laboratory. First semester.
Prerequisite: M. E. 176. Two Units.

178. Mechanical Engineering Laboratory. Continuation of M. E. 177. Six hours laboratory. Second semester.
Prerequisite: M. E. 177. Two Units.

180. Mechanical Engineering Laboratory. Experimental study of simple measuring devices and their application in the determination of such quantities as power of engines and motors, heating value of fuels and efficiencies of prime movers. For civil engineering students. Three hours laboratory. Second semester.
Prerequisite: To accompany M. E. 130. One Unit.

181. Heating and Ventilation Laboratory. Experimental determination of the radiation from various surfaces. The control of temperature and humidity. The operation of fans. Three hours laboratory. First semester.
Prerequisite: To accompany 131. One Unt.

183. Aerodynamics Laboratory. Wind tunnel tests to measure airfoil action and stability. Three hours laboratory. First semester.
Prerequisite: To accompany M. E. 133. One Unit.

184. Airplane Laboratory. Tests of the strength of struts and frames used in airplane wings, hulls, engine nacelles and landing gears. Three hours laboratory. Second semester.
Prerequisite: To accompany M. E. 134. One Unit.

185. Internal Combustion Engine Laboratory. Experimental study of combustion. Effects of increased compression, preheating, supercharging and shape of combustion space. Efficiency tests of internal combustion engines. Six hours laboratory. First semester.
Prerequisite: To accompany M. E. 135. Two Units.

186. Internal Combustion Engine Laboratory. Continuation of M. E. 185. Six hours laboratory. Second semester.
Prerequisite: To acompany M. E. 136. Two Units.

187. Time Study Laboratory. Stop watch and camera studies of various jobs. Development of the one best way to perform a job. Development of the time standard for a job. Six hours laboratory. First semester.
Prerequisite: To accompany M. E. 137. Two Units.

188. Production Laboratory. Scheduling and job instruction applied to work in the University shops and laundry. Visits to manufacturing plants. Three hours laboratory. Second semester.
Prerequisite: To accompany M. E. 138. One Unit.

189. Vibration Laboratory. Vibrations of spring and weight without damping. Torsional vibration. Beam and weight. Damped vibrations. Equivalent systems. Mechanical and electrical models of vibration systems. Three hours laboratory. First semester.
Prerequisite: To accompany M. E. 139. One Unit.

191. Machine Design. Principles of kinematics, mechanics, properties of materials and shop processes applied to the design of machines. Six hours lecture, computation and drafting. First semester.
Prerequisite: M. E. 16. Two Units.

192. Machine Design. Continuation of M. E. 191. Six hours lecture, computation and drafting. Second semester.
Prerequisite: M. E. 191. Three units.

194. Power Plant Design. Principles of engineering economy applied to the selection of power plant sites and equipment. Layout of a complete power plant. Five hours lecture, computation and drafting. Second semester.
Prerequisite: M. E. 126. One unit.

MILITARY SCIENCE AND TACTICS

Lower Division Courses

The lower division or basic course is prescribed for all first-year and second-year undergraduate students who are citizens of the United States, able bodied, and under twenty-one years of age at the time of admission to the University. A first-year or second-year student claiming exemption because of non-citizenship, physical disability, or age will present to the Department of Military Science and Tactics, a petition, on the prescribed form, for such exemption. Pending action on his petition the student will enroll in the courses prescribed for his year and enter upon the work of such courses.

1-2 Freshman Field Artillery. Military fundamentals. map reading, leadership, field artillery instruction. One hour theory, two hours practice. Two semesters. Three units.

3-4. Sophomore Field Artillery. Field Artillery instruction, leadership, operation and maintenance of Field Artillery motor transport, fire control instruments, battery communications. One hour theory, two hours practice. Two semesters. Three units.

Upper Division Courses

The advanced course is open to selected students who satisfactorily complete the basic course. It covers a period of two years and is designed to qualify the student in the duties of a commissioned officer. Students once registered for this course must carry it to completion. The advanced course student is given an allowance of thirty-six dollars for uniform-clothing for the two-year period, and is paid approximately seven dollars per month, except during the six weeks summer training camp period. Students who carry this course to a successful completion are commissioned as second Lieutenants in the Officers' Reserve Corps of the United States Army.

101-102. Junior Field Artillery. Military fundamentals, reconnaissance, selection and occupation of position, leadership, gunnery, military motor vehicles, pistol marksmanship. Three hours theory, two hours practice. Two semesters. Eight units.

103-104. Senior Field Artillery. Military history and policy, military law, administration, leadership (Work as instructor in all practical basic field artillery subjects), tactics. Three hours theory, two hours practice. Two semesters. Eight units.

Summer Training Camp

Advanced course students are required to attend and satisfactorily complete, between the Junior and Senior years, one summer instruction camp of six weeks duration. They receive pay at the rate of twenty-one dollars per month during camp, mileage to and from

camp, and all expenses while in camp, including rations, medical attention, clothing, laundry service, and lodging.

Ceremonies

In addition to the above requirements, five hours per semester are devoted to parades and reviews when the entire cadet corps is formed. The dates when these additional formations are scheduled will be designated during the particular semester in which they are held.

PHILOSOPHY

Students who wish to make Philosophy their major subject, besides completing the other required courses of the lower division, must pass the courses in Philosophy 5-6 with at least a grade of C.

The major program must include 24 units of upper division courses in Philosophy. An average grade of C or higher must be maintained in all courses of the major and, at the end of the senior year, each student must pass a comprehensive final examination.

5-6. History of Philosophy. A comprehensive survey of the whole history of philosophy, ancient, medieval and modern. Lectures, essays and supplementary readings. Three hours. Both semesters. Six units.

9. Logic. An introductory course in the science of correct thinking, comprising both formal, traditional, or deductive logic together with inductive inference and scientific method, with special stress on the structures of the syllogism and the detection of fallacies. Exercises in the construction and criticism of arguments. Three hours. One semester. Three units.

10. Epistemology. The theory of knowledge. An analysis of the critical problem and its many proposed solutions. Scepticism vs. dogmatism. Realism vs. idealism. Empiricism vs. rationalism. The nature, possibility, extent and criteria of certitude. Truth and error. The trustworthiness of sensation and reason. Three hours lecture. One semester. Three units.

11. Metaphysics. The chief problems of ontology and cosmology, leading to a rational interpretation of the universe. Fundamental concepts and the first principles of reality studied both in the abstract and in their application to the inorganic world. Three hours lecture. One semester. Three units.

12. General Psychology. The study of man as a psychophysiological organism. A general survey of scientific psychology dealing with neural organization and function, sensation, preception, learning, the measurement of intelligence, emotion and feeling, volition, character and personality. A brief survey of divergent schools of psychology. Three hours. One semester. Three units.

13. Philosophy of Nature. Beginning with a brief introduction to philosophy, this course investigates the chief problems of cosmology and seeks a rational interpretation of the physical universe, both of the inorganic world and of the organic world exclusive of conscious phenomena. Matter, energy, quantity, motion, space, time. Life in general, its nature, origin, and development. Mechanism and teleology. Three hours. One semester. Three units.

14. Philosophy of Mind. Rational psychology from the philosophical standpoint. This course seeks a philosophy of man, the phenomena and source of man's conscious life. Intellect and its chief operations, the origin of ideas. Will and its motivation, free will and determinsm. The nature, origin, and destiny of the human soul. The relation between the psychic and physical parts of man. Three hours. One semester. Three units.

31. Logic. The reasoning faculties and processes. Law of thought. Truth. Certitude. Doubt. False Systems. Three hours. First semester. One and one-half units.

32. Ontology, Psychology. Being, its origin, development, explanation. Life, its origin and kinds. Origin of Species. Darwinism. Huxley. Haeckel. The soul, its origin and spirituality. Three hours. Second semester. One and one-half units.

33. Theodicy. God, His existence, nature and attributes. Creation. Providence. Miracles. Three hours. First semester. One and one-half units.

34. Ethics. Right and Wrong. Natural Law. Sanction of Law. False forms of morality. Worship. Homicide. Suicide. Dueling. Society. Marriage. Divorce. Socialism. Theories of government. Suffrage. Liberty of the press. Church and State. Three hours. Second semester. One and one-half units.

35. Logic and Natural Philosophy. This, together with Philosophy 36, 37, and 38, forms a compendious course designed for engineering students. It begins with a brief survey of logic, relating deduction and mathematics, induction and scientific method. It continues with the cosmological problem: the philosophical interpretation of the physical universe. Three hours. One semester. One and one-half units.

36. Philosophy of Living Beings. A study of life in general, beginning with merely organic life and ending with the intellectual life of man. Stress is placed on the study of man, the relations between his mind and body, his chief mental operations and their ultimate principle, the nature, origin, and destiny of the human soul. Three hours. One semester. One and one-half units.

37. Metaphysics. The problem of the validity of human knowledge: truth, error, doubt and certitude. The problem of reality: being and becoming, substance and causality. The problem of the ultimate cause of all reality: God. His existence and attributes. Three hours. One semester. One and one-half units.

38. Ethics. General principles: the good life, right and wrong, the moral act, natural law, conscience, rights and duties. Application of the principles to man's individual and social life: man's personal, marital, proprietary, industrial, political, and international rights and obligations. Three hours. One semester. One and one-half units.

101. Philosophy of Mind. A study of both the phenomena and the source of consciousness. Sensation: the nervous system, perception, imagination, memory, appetition, instinct. Thought: the principle of thought, the origin of ideas, attention, abstraction, reflection,

judgment, inference. Free-will vs. determinism. Nature, origin and destiny of the human soul. Union of the soul and body, relation between the psychic and physical parts of man. Three hours lecture. One semester. Three units.

102. Philosophy of Theism. Theodicy. Theism, pantheism deism, agnosticism and atheism examined from the purely philosophical standpoint. God in the philosophies of Plato, Aristotle, Augustine, Aquinas, Descartes, Spinoza, Leibnitz and Kant. Critical examination of the arguments for God's existence. Attributes of God. Providence. God and the problem of evil. God and human free-will. Three hours lecture. One semester. Three units.

103. Fundamental Ethics. The general theory of ethics: the aim of human life, the nature of the moral act, the norm of morality, natural and positive law, conscience, right and duty. Examination of hedonism, altruism, utilitarianism, moral sensism, moral positivism, moral rationalism, moral evolutionism, and other systems. Three hours. One semester. Three units.

104. Applied Ethics. The application of general ethical principles to definite human rights and duties. Individual ethics: the right to life, honor, and property. Social ethics: domestic society, marriage and the family; industrial society, capital and labor, industrial disputes; civil society, the state and its origin, nature, forms, rights, and functions. International ethics: the right of nations, international law, peace and war. Three hours. One semester. Three units.

105. Ancient Philosophy. A study of the development of Greek thought from the pre-Socratic era, through Plato and Aristotle, to the end of the Greco-Oriental period. Lectures, essays, and required readings. Three hours. One semester. Three units.

106. Medieval Philosophy. A study of the development of philosophy from the Patristic age to the Renaisance, with stress on the Scholastic philosophy of the twelfth and thirteenth centuries. Its decline and modern revival. Lectures, essays, and required readings. Three hours. One semester. Three units.

107. Modern Philosophy. The philosophy of the Seventeenth and Eighteenth Centuries, from Descartes up to but not including Kant. The parallel progress of the Intellectualist and Empiricist movements. Lectures, essays, and required readings. Three hours. One semester. Three units.

108. Recent Philosophy. The philosophy of the Nineteenth and Twentieth Centuries, Kant to the present day. A rather thorough study of German Idealism: Kant and his successors. Positivism, evolutionism, pragmatism, neo-realism, and the main currents of recent speculation. Lectures, essays, and required readings. Three hours. One semester. Three units.

109. Metaphysics. The main problems of epistemology and ontology: a study of first principles, both of knowledge and of reality. The critical problem: the trustworthiness of human knowledge; skepticism, idealism, realism, empiricism, rationalism, positivism, pragmatism, relativism. The possibility, nature, extent, and criteria of certitude. The ontological problem: being and becoming, substance and causality. Three hours. One semester. Three units.

110. Metaphysics. A study of the absolutely ultimate in reality. Theism, atheism, agnosticism, deism, naturalism, pantheism examined from the purely philosophical standpoint. God in the philosophies of Plato, Aristotle, Augustine, Aquinas, Descartes, Spinoza, Leibniz, Hume, Kant, and others. Critical examination of the arguments for God's existence and attributes. Providence and the problem of evil. Three hours. One semester. Three units.

121. Advanced Logic. An advanced course in the field of traditional logic, with systematic reference to its metaphysical and epistemological principles. Open only to philosophy majors.. Three hours. One semester. Three units.

122. Advanced Metaphysics. An intensive study of the questions and problems concerning mind and reality, with special reference to modern and recent metaphysical theory. Three hours. One semester. Three units.

PHYSICS

1. Mechanics, Molecular Physics, Sound. General principles of matter. General properties of bodies. Equilibrium. Gravity. Pendulum. Properties peculiar to solids. Capillarity. Hydro-dynamics. The properties of gases. Aerodynamics. Production, propagation and reflection of sound. The physical theory of music. Three hours lecture. First semester. Three units.

2. Physical Laboratory. To accompany Physics 1. Three hours laboratory. First semester. One unit.

3. Light, Heat, Electricity. Transmission, velocity and reflection of light. Mirrors. Lenses. Dispersion and achromatism. Optical instruments. The eye. Double refraction. Interference and polarization. Properties of magnetism. Laws of magnetic action. Terrestrial magnetism. Quantitative laws of electric action. Distribution. Electro-static induction of influence. Electric machines. Condensation of electricity. Voltaic cell. Its modifications. Magnetic field due to current. Galvanometers. Ohm's law. Conversion of electric energy into heat. Thermo-electricity. Electro-dynamics. Electro-magnets. Magnetization of iron. Telegraphy. Electro-magnetic induction. Passage of electricity through gases. Magneto and dynamo-electric machines. Dia-magnetism. Connection between electricity and light. Three hours lecture. Second semester.
Prerequisite: Physics 1, 2. Three Units

4. Physical Laboratory. To accompany Physics 3. Three hours laboratory. Second semester.
Prerequisite: Physics 1, 2. One Unit.

12. General Physics. Lectures with illustrations and problems covering the properties of matter, mechanics of solids and fluids, wave motion and sound. Three hours lecture. First semester. Three units.

13. Physical Laboratory. To accompany Physics 12. Six hours laboratory. First semester. Two units.

14. General Physics. Lectures with illustrations and problems in relation to heat, magnetism, electricity and light. Three hours lecture. Second semester. Three units.

15. Physical Laboratory. To accompany Physics 14. Six hours laboratory. Second semester.
Prerequisite: Physics 12, 13. Two Units.
Courses 12-15 are designed especially for students in the College of Engineering.

104. Electrical Measurements. Experimental study of fundamental electric circuit parameters and development of techniques for determination of their values. Limitations on accuracy of measurements are studied. One hour lecture and three hours laboratory. Second semester.
Prerequisite: E. E. 125. Two units.

121. Astronomical Physics. A laboratory course in the study of astronomical, meteorological and seismological phenomena in connection with the Observatory. Hours and credits to be arranged.
Prerequisite: One year of Physics and two years of Mathematics.

POLITICAL SCIENCE

Students who wish to make Political Science their major subject, besides completing the other required courses of the lower division, must pass the courses in History 1-2 and Political Science 1-2 with at least a grade of C.

The major program must include 24 units of upper division courses in Political Science. An average grade of C must be maintained in all courses of the major and, at the end of the senior year, each student must pass a comprehensive final examination.

1-2. Introduction to Political Science. Fundamental definitions and distinctions: state, government, nation, sovereignty, individual liberty. Nature, origin and forms of government. Separation of powers. Functions of government. Individualism, socialism and social reform. Three hours. Both semesters. Six units.

101. American National Government. Origin and development of the Constitution. Powers, functions and interrelation of executive, administrative, legislative and judicial branches of the government. Expansion of governmental activities. The national party system. Three hours. First semester. Three units.

102. National Administration in the United States. History, organization, personnel, business methods and accomplishments of the various departments of the administrative branch of the United States Government. Three hours. Second semester. Three units.

103. Theory of the State. A study of political theory dealing with the problems of the nature of the state, the purpose of government, liberty and authority, the nature of law and justice as treated by various political philosophers. Three hours. One semester. Three units.

104. American Political Theory. Underlying theories and principles of American governmental policy. Three hours. One semester. Three units.

105. American State and County Government. Constitutional development and governmental organization of the American states and counties, with special reference to California. Three hours. One semester. Three units.

106. Municipal Government. The nature, government and problems of cities, particularly in the United States. Three hours. One semester. Three units.

107. Introduction to International Law. The nature and scope of international law. Rights and duties of states. Jurisdiction. Nationality. Relations of states in peace and war. International law and the League of Nations. Three hours. One semester. Three units.

108. International Relations. The nature and importance of international relations. Underlying problems. Nationalism, militarism, imperialism. Agencies of control: diplomatic, administrative. Development of international organization culminating with the League of Nations. Three hours. One semester. Three units.

109. Political Parties in the United States. The political party as part of the political machinery. Party organization. Campaign methods. Public opinion and party leadership. The true functions of parties. Party responsibility. Three hours. One semester. Three units.

PSYCHOLOGY

1. General Psychology. The study of man as a psycho-physiological organism. A general survey of scientific psychology dealing with neural organization and function, sensation, perception, learning, the measurement of intelligence, emotion and feeling, volition, character and personality. A brief surveiy of divergent schools of psychology. Three hours. One semester. Three units.

PUBLIC SPEAKING

1. Fundamentals of Expression. The fundamental principles of expression; the speaking voice; body and expressive movement. Training the voice and body to be the willing and obedient servant of the mind. Each student appears in memorized work in class. Two hours. First semester. One unit.

2. Fundamentals of Expression. A continuation of course 1, with development of impersonation and interpretation. Two hours. Second semester. One unit.

3. Philosophy of Expression. An advanced study of the principles of expression; advanced training of the voice; embodiment of principles in practice work. A short selected cutting of standard literature is presented by each student at each class. Special training in the interpretation of longer selections for public presentation. Two hours. First semester. One unit.

4. Philosophy of Expression. A continuation of course 3, with special emphasis upon impersonation, and standard speeches. Two hours. Second semester. One unit.

11. Fundamentals of Expression. A short course in expression intended primarily for students in the College of Engineering. Fundamentals of expression; the speaking voice; expressive movement; impersonation; interpretation. Each student must appear in memorized work at each class. One hour. First semester. One unit.

12. Fundamentals of Expression. A continuation of course 11. One hour. Second semester. One unit.

101. Aesthetics. An advanced course where every principle taught in previous courses is put to practical test. Each student is required to memorize and present during the course a short play, in which he impersonates all of the different characters and interprets both the particular parts and the play as a whole. One hour. First semester. One unit.

102. Aesthetics. A continuation of course 101. One hour. Second semester. One unit.

107. Dramatic Seminar. The mechanics of the theater and the staging of a play, both theory and practice. Lines: voice, body, impersonation. Business: pantomime and stage. Plots: ground, light, scenery, property. Mechanics: illusions and terminology. Criticism: play-reviewing and dramatic criticism. Hours and credits to be arranged.

109. Debating Seminar. The application of the principles of expression to the Debate. A study of the particular form of debating. Presentation and arrangement of ideas. Practical application of methods in connection with a major collegiate debate. Hours and credits to be arranged.

RELIGION

(A). Essentials of Christian Doctrine. Various creeds. The Apostles' Creed. Each article of the Creed is studied in particular, attention being given to any subject bearing directly on these articles, as Sin, the Powers of the Church, Infallibility, etc. Two hours. First semester. One unit.

(B). Essentials of Christian Doctrine. The Law of God. What is commanded or forbidden by the Decalogue is studied in detail. The Precepts of the Church, Grace, Prayer, and each of the Seven Sacraments together with collateral subjects. Two hours. Second semester. One unit.

1. Fundamental Apologetics. Revelation; guarantees of Revelation. Documents of Revelation. The authenticity, integrity and reliability of the four Gospels.
Two hours lecture. One semester. One unit.

2. The Church Of Christ. The Catholic Church as the Church of Christ. Its authenticity as a teaching and ruling body. The primacy of St. Peter. The nature and character of Christ's Church. The marks of the true Church of Christ.
Two hours lecture. One semester. One unit.

3. The Existence and Essence of God. The idea of the belief in God. The nature of Faith. The necessity and certainty of Faith. Sources of proof of God's existence. The nature and essence of God. The attributes of God. Pantheism and Atheism. Fundamental notions of the mystery of the Trinity.
Two hours lecture. One semester. One unit.

4. Creation. The Creation of the world. Original Justice. Original Sin. The Immaculate Conception. The General Judgment; Heaven; Hell; Purgatory.
Two hours lecture. One semester. One unit.

101. God The Redeemer. The Mystery of Redemption. The Incarnation. The divine and human natures in Christ. The divine and

human wills of Christ, his theandric actions.
Two hours lecture. One semester. One unit.

102. God and Redemption. The merits of Christ. The Worship of Christ. The devotion to Mary, the Mother of God. The nature and necessity of Grace. Kinds of Grace.
Two hours lecture. One semester. One unit.

103. The Sacraments. The Sacraments as a means of Grace. The nature and efficacy of the Sacraments. Discussion of the Sacraments of Baptism, Confirmation and the Holy Eucharist.
Two hours lecture. One semester. One unit.

104. The Sacraments. A continuation of Religion 103. Discussion of the Sacraments of Penance, Extreme Unction, Holy Orders and Matrimony. A discussion of Christian morality.
Two hours lecture. One semester. One unit.

105-106. The New Testament, especially the Four Gospels. A word for word explanation of the text. Apparent discrepancies explained and harmonized. Two hours. Both semesters. Two units.

SPANISH

1. Elementary Spanish. Elements of Spanish grammar. Drill in pronunciation. Vocabulary. Three hours. First semester.
Three units.

2. Elementary Spanish. A continuation of Spanish 1. Syntax, oral and written exercises. Reading from the simpler Spanish prose. Three hours. Second semester.
Prerequisite: Spanish 1. Three Units.

3. Intermediate Spanish. Review of grammar and syntax. Oral and written exercises. Reading of somewhat difficult Spanish prose. Three hours. First semester.
Prerequisite: Spanish 2 Three Units.

4. Intermediate Spanish. Reading, written and oral exercises. This course aims at preparing the student to read the more difficult Spanish writers. Three hours. Second semester.
Prerequisite: Spanish 3. Three Units.

5, 6. Advanced Composition and Reading. Composition; sight reading; oral and written reports in Spanish; historical survey of Spanish literature. Conducted almost entirely in Spanish. Three hours. Both semesters. Six units.

THE OBSERVATORY

ASTRONOMICAL, METEOROLOGICAL AND SEISMOLOGICAL OBSERVATORY

John Anthony Weber, S.J.
Director

Albert Joseph Newlin, B.S., J.D., D.Sc.
Assistant Director

The Astronomical and Meteorological Observatories were under the immediate direction of the late Father Ricard, known throughout the country as the "Padre of the Rains." In recognition of the work of Father Ricard, the Knights of Columbus of California built the Knights of Columbus Ricard Memorial Observatory, which provides the facilities and equipment for a much more comprehensive investigation of astronomical and meteorological problems, and a correspondingly greater service to the country.

Through its Seismological Station the University is a member of a chain of seismological stations maintained by the Jesuits throughout the world, and has been a pioneer on the Pacific Coast in the recording and observation of seismological disturbances, as well as in the study of their causes.

The University Seismological Station operates two Wiechert seismographs, consisting of one vertical and two horizontal components. Recently, however, a new impetus has been given this branch of geophysical investigation by the construction of a vault embodying all that was found best and latest in stations of this type. The Seismological Station is now in possession of three new Galitzin Seismometers of the long-period type, and two horizontal components of the Wood-Anderson Seismometers which were constructed at Pasadena for this Station, all of which are located in the new vault. The Wood-Anderson Seismometers have been designed for a special study of local earthquakes and are the short-period type. Finally, the University hopes to complete this station by the installation of a "Shortt Synchronome Clock," thus assuring accurate time for all our records.

Of special prominence, however, is the work which has been done in long range weather forecasting through a study of sun spots. This line of study was instituted by the late Father Ricard over a generation ago and in the meantime he has built up a large mass of data in this regard, so that the records and observations at the University are perhaps the most complete of any in the country. Monthly forecasts are sent out regularly from the Observatory. With the aid of such new instruments as the 18.5-inch reflector and the spectroheliograph, the Director of the Observatory will be enabled to pursue his researches with greater facility and success.

DEGREES IN COURSE

MAY 12, 1945

BACHELOR OF ARTS

*George Glein Hagmaier

*Lawrence Joseph Slavich

BACHELOR OF SCIENCE

Economics

Samuel Conti

English

Lawrence Felice Bertolani

Political Science

Lee Bernard Puncochar

BACHELOR OF COMMERCIAL SCIENCE

Frederick Clemens Lautze

Joseph Arthur Rasmusson

* Cum Laude

REGISTER OF STUDENTS
1945-46

Abbreviations Used

A. & S.—College of Arts and Sciences
B.A.—College of Business Administration
C.E.—Civil Engineering
E.E.—Electrical Engineering
Engr.—College of Engineering
Fr.—Freshman
Gr.—Graduate
Jun.—Junior
M.E.—Mechanical Engineering.
Sen.—Senior
Soph.—Sophomore
Sub.-Sr.—Sub-Senior Engineer

Abbott, John T.	Fr. A. & S.	Vallejo
Abel, Charles E.	Fr. B. A.	Oakland
Adza, Michael J.	Fr. B. A.	Los Angeles
Ahern, John J.	Jr. B. A.	Berkeley
Ahern, William H.	Jr. A. & S.	Oakland
Aherne, George A.	Jr. B. A.	San Francisco
Alhadef, John J.	Fr. A. & S.	Los Gatos
Alhadef, William P.	Soph. Engr.	Van Nuys
Al-Jazrawi, John M.	Fr. Engr.	Baghdad, Iraq
Amar, Constant R.	Fr. Engr.	San Leandro
Amort, Norman S.	Fr. B. A.	Matagalpa, Nicaragua
Anderson, Edwin J.	Fr. Engr.	Oakland
Anderson, Joseph C.	Fr. A. & S.	Oakland
Andreatta, Robert	Fr. A. & S.	Mount Shasta
Aragon, Leopoldo	Soph. A. & S.	Panama City, Panama
Arata, Thomas J.	Sen. A. & S.	San Mateo
Arbios, James B.	Fr. B. A.	Stockton
Arena, V. Thomas	Fr. A. & S.	Phoenix, Arizona
Armstrong, William R.	Fr. A. & S.	Los Gatos
Astrue, Robert W.	Fr. Engr.	San Francisco
Aubrey, James F.	Fr. B. A.	Oakland
Azevedo, Lee Verne A.	Soph. B. A.	Santa Clara
Aziz, George K.	Fr. A. & S.	Los Gatos
Baccari, Alessandro, M.	Fr. A. & S.	San Francisco
Bachan, Paul W.	Fr. A. & S.	Watsonville
Bacigalupo, David E.	Soph. B. A.	Brooklyn, N. Y.
Baggott, John E.	Fr. Engr.	San Jose
Banister, John R.	Fr. A. & S.	San Jose
Barakatt, Thomas A.	Fr. A. & S.	Stockton

Barrett, Richard H.	Fr. Engr.	San Mateo
Bean, James E.	I Law	San Jose
Beck, Fred J.	Soph. Engr.	San Francisco
Becker, John R.	Soph. A. & S.	Los Gatos
Belli, Carlos G.	Fr. A. & S.	Managua, Nicaragua
Beltrami, Alexander P.	Fr. Engr.	San Francisco
Berlinger, Melbourne F.	Fr. A. & S.	Honolulu, T. H.
Bernal, Raymond A.	Fr. Engr.	San Jose
Bevilacqua, Edward U.	Fr. A. & S.	San Leandro
Binckley, Basil C.	Fr. Engr.	Claremont
Bird, Thomas S.	Fr. A. & S.	Los Gatos
Biscay, Marcel P.	I Law	San Mateo
Blach, James P.	Fr. A. & S.	Los Altos
Blake, Freeman D.	Fr. A. & S.	San Jose
Blickle, Richard C.	Fr. A. & S.	Woodland
Block, John R.	Fr. A. & S.	Gridley
Bluett, Raymond E.	Soph. B. A.	Berkeley
Bohneberg, Harold A.	Soph. Engr.	Palo Alto
Bolton, Robert B.	Soph. A. & S.	Oakland
Bond, Richard M.	Fr. Engr.	Gridley
Borghello, Cornelio J.	Fr. A. & S.	San Francisco
Boruck, Holbrook M.	Fr. A. & S.	San Jose
Bowe, James F.	Fr. B. A.	Stockton
Boyd, Claude J.	Fr. Engr.	San Francisco
Boyle, Richard P.	Fr. A. & S.	Oakland
Brisley, H. Leonard	Fr. Engr.	Richmond
Britton, Alfred B. Jr.	I Law	San Jose
Brown, J. Warren	Fr. A. & S.	Los Angeles
Brown, M. Joseph	Fr. Engr.	Beverly Hills
Bruder, Robert M.	Fr. A. & S.	Los Gatos
Bryan, William F.	Soph. A. & S.	Salinas
Bryon, Alvaro	Soph. Engr.	Cali, Colombia
Buckley, John E.	Fr. A. & S.	San Francisco
Burke, Edward L.	Jun. A. & S.	Los Gatos
Burke, Edward T.	Jun. A. & S.	Los Gatos
Byrne, Andrew T.	Fr. Engr.	Santa Cruz
Byrne, Hugh M.	Fr. A. & S.	Oakland
Callejas, Alfonso E.	Soph. Engr.	Chinandega, Nicaragua
Camozzi, Robert A.	Soph. A. & S.	Santa Rosa
Campbell, M. Tenney	Soph. Engr.	Honolulu, T. H.
Campion, John E.	Soph. A. & S.	Oakland
Campo, Frederick W.	Fr. A. & S.	San Jose
Canavero, H. James	Fr. Engr.	Los Gatos
Canelo, Adolph B. III	Fr. A. & S.	San Francisco

Cassimus, Victor M.	Fr. Engr.	Oakland
Castillo, Elpidio J.	Fr. Engr.	Caracas, Venezuela
Chargin, John M.	I Law	San Jose
Christensen, Burnett J.	Soph. Engr.	Los Altos
Cimino, Robert R.	I Law	San Jose
Clark, William G.	Fr. B. A.	Redwood City
Clarke, Russell P.	III Law	Santa Clara
Collins, Andrew J.	Fr. A. & S.	San Francisco
Collins, James E.	Fr. Engr.	San Mateo
Conner, John R.	Fr. A. & S.	Seattle
Connolly, Randolph C.	Soph. A. & S.	Los Gatos
Conrado, John J.	Fr. Engr.	Santa Cruz
Conte, Louis M.	Fr. A. & S.	Los Gatos
Copple, Frank T. II	Fr. Engr.	Glendale
Cordero, Rafael A.	Soph. Engr.	San Miguel, El Salvador
Costello, Thomas T.	Soph. A. & S.	Los Gatos
Coughlan, John F.	Soph. A. & S.	San Francisco
Cramer, Robert T.	Soph. A. & S.	Oakland
Cribari, Kenneth W.	Jun. B. A.	San Jose
Cristofaro, Joseph D.	Fr. A. & S.	Oakland
Croak, Francis P.	Soph. Engr.	Livermore
Crowley, John J.	Fr. Engr.	Huntington Park
Crowley, Robert P.	Jun. A. & S.	Spokane, Washington
Cuneo, William J.	Fr. Engr.	Stockton
Cunha, D. David	Fr. Engr.	Santa Clara
Cunha, Fred	Fr. Engr.	Watsonville
Daniels, William E.	Fr. Engr.	Redwood Valley
Dardano, William	Fr. A. & S.	San Francisco
Dawe, John R.	Soph. Engr.	Redding
de Bord, Phillip M.	Fr. A. & S.	Pacific Grove
Deering, Michael A.	Fr. A. & S.	San Francisco
Deignan, Patrick E.	Soph. A. & S.	Los Gatos
DeMarco, John J.	Fr. Engr.	Fall River, Mass.
DeMartini, Alfred J., Jr.	Fr. B. A.	San Francisco
Dematteis, Joseph J.	Soph. B. A.	Redwood City
Dempsey, James J.	Soph. A. & S.	Los Gatos
Depaoli, Louis, Jr.	III Law	San Jose
Devlin, Raymond A.	Jun. A. & S.	Los Gatos
DiCorti, Vincent	Fr. Engr.	San Francisco
Ditty, Angelo R.	Fr. Engr.	Daly City
Dolcini, Peter C.	Jr. A. & S.	Petaluma
Donati, James E.	Fr. B. A.	San Jose
Donnelly, William F.	Fr. B. A.	San Mateo
Donovan, Michael J.	Fr. B. A.	Sacramento

Dorsey, William F.	Soph. Engr.	Palo Alto
Dotoli, Franklin D.	Soph. A. & S.	Newark, N. J.
Dougherty, Robert S.	Soph. Engr.	San Francisco
Dowd, Patrick F.	Fr. A. & S.	Los Gatos
Doyle, Bernard P.	Jr. A. & S.	Menlo Park
Drees, Joseph M.	Soph. Engr.	Saratoga
Duggan, Donald J.	Jr. A. & S.	Los Gatos
Dusbabek, Virgil J.	Soph. Engr.	Faribault, Minnesota
Edwards, N. Dee	Fr. B. A.	Fresno
Elliott, Charles W.	Jun. A. & S.	Los Gatos
Eltchinoff, Donald E.	Fr. A. & S.	Berkeley
Engh, Peter B.	Fr. Engr.	Los Angeles
Erck, John F.	Soph. B. A.	Puyallup, Wash.
Faber, John J.	Fr. A. & S.	San Francisco
Fahrner, Robert A.	Fr. A. & S.	Los Gatos
Faller, Miguel	Fr. Engr.	Yucatan, Mexico
Faraone, Frank R.	Fr. Engr.	San Francisco
Feeney, John L., Jr.	Fr. A. & S.	Willows
Feeney, William J.	Soph. A. & S.	San Francisco
Feeny, L. Robert	Fr. Engr.	San Francisco
Felt, James W.	Soph. A. & S.	Los Gatos
Fennelly, Edward J.	Jun. B. A.	Oakland
Ferreira, Clyde A.	Fr. Engr.	Richmond
Fitzpatrick, William J.	I Law	Butte, Montana
Flitcroft, Arthur I.	Fr. A. & S.	Sacramento
Ford, Thomas J., Jr.	Fr. Engr.	San Jose
Fourie, Olivier R.	Fr. A. & S.	South San Francisco
Fraass, Frank W.	Fr. Engr.	Flemington, N. J.
Franceschina, Lawrence J.	Soph. Engr.	San Francisco
Frazer, John D.	Fr. Engr.	Santa Clara
Frese, William L.	Soph. B. A.	Mill Valley
Fritter, Raymond V.	Fr. B. A.	San Jose
Fye, R. Stanley	Fr. Engr.	San Francisco
Gallagher, Francis J.	Jun. A. & S.	Los Gatos
Gallagher, James K.	Soph. A. & S.	Saratoga
Gallagher, Neil I.	Jun. A. & S.	Tucson, Arizona
Gallagher, William J.	Fr. Engr.	Santa Clara
Garcia, Eugene N.	Jun. A. & S.	Los Gatos
Garcia, Harold A.	Fr. Engr.	San Leandro
Garrison, William A.	Fr. A. & S.	Salinas
Gennette, James J.	Jun. A. & S.	Los Gatos
Genochio, Frank J.	Fr. Engr.	Camanche

Gephart, Frederick H.	Fr. Engr.	Spokane, Wash.
Giovannetti, Angelo, Jr.	Sr. Engr.	San Francisco
Gleason, Joseph J., Jr.	Soph. B. A.	Trinidad, Colorado
Gliebe, Gerald G.	Fr. Engr.	Sacramento
Going, E. Jackson, Jr.	Soph. Engr.	San Jose
Golden, Patrick E.	Fr. A. & S.	Berkeley
Gomez, Luis J.	Fr. Engr.	Caracas, Venezuela
Graham, Gerald D.	Fr. Engr.	San Anselmo
Gray, John F.	Jun. A. & S.	San Bernardino
Gray, John H.	Jun. A. & S.	Los Gatos
Gray, William T.	Soph. Engr.	Burlingame
Grenfell, George E.	Jun. A. & S.	Merced
Griffin, Philip J.	Soph. A. & S.	Watsonville
Griffin, Thomas F.	Soph. Engr.	San Francisco
Grim, R. Merrill	Fr. Engr.	Campbell
Guerin, Thomas A.	Fr. B. A.	San Francisco
Gundry, Robert C.	Sen. A. & S.	Bakersfield
Gurries, Richard M.	Jun. Engr.	San Jose
Gurries, Robert H.	Fr. A. & S.	San Jose
Hackett, Walter T.	Sen. A. & S.	Cleveland, Ohio
Hagan, William M.	Soph. A. & S.	Los Gatos
Hall, Raymond V.	Soph. A. & S.	Piedmont
Hanley, John J.	Soph. A. & S.	Los Gatos
Hardin, James R.	I Law	Sonora
Harris, Glenn A.	Soph. Engr.	Vallejo
Harris, Herbert E.	Soph. A. & S.	Los Gatos
Hayes, V. Austin	Soph. A. & S.	San Jose
Hazelwood, John F.	Jun. B. A.	Oakland
Heacock, James H.	Fr. Engr.	Oakland
Herle, Stephen J.	Fr. Engr.	Montebello
Hernandez, Gustavo A.	Fr. Engr.	Quito, Ecuador
Herzberg, Lawrence J.	Jun. A. & S.	Los Gatos
Hill, Richard P.	Fr. B. A.	Vallejo
Hilsdale, E. Paul	Jun. A. & S.	Los Gatos
Hogan, Edmund J.	Fr. A. & S.	Los Gatos
Holm, J. Ivan	Sen. A. & S.	San Mateo
Holm, Thomas N.	Sen. A. & S.	San Mateo
Hooper, C. Melvin	Jun. A. & S.	San Francisco
Houlehan, Thomas J., Jr.	Fr. Engr.	Ashland, Kentucky
Hovorka, Charles E.	Fr. A. & S.	Los Angeles
Huttlinger, Robert C.	Fr. Engr.	Los Altos
Imlay, James J.	Fr. A. & S.	Santa Cruz
Innocenti, Elmo R.	Fr. A. & S.	Salem, Oregon

Jacobs, Robert N.	Soph. A. & S.	Crockett
Jeffcoat, Charles B.	Fr. B. A.	San Jose
Jenkins, Merrill E.	Soph. Engr.	Los Gatos
Joesten, William F.	Fr. A. & S.	San Jose
Johnson, Charles H.	Fr. Engr.	San Jose
Johnson, Gerald R.	Fr. A. & S.	Sacramento
Johnson, J. Woodward	Jun. A. & S.	Los Gatos
Johnson, Norman R.	Jun. B. A.	Burlingame
Johnston, Don F.	Fr. Engr.	Taft
Jones, Leo H.	Fr. B. A.	Stockton
Jones, Leonard L.	Fr. A. & S.	Seattle, Wash.
Kaliterna, Milton H.	Fr. Engr.	Santa Clara
Kane, Thomas J., Jr.	I Law	Redwood City
Keegan, Frank L.	Fr. A. & S.	Santa Rosa
Keelan, Edward T., Jr.	Fr. B. A.	Compton
Keith, John C.	Soph. A. & S.	Los Gatos
Kelly, Alfred O.	Soph. A. & S.	San Luis Obispo
Kelly, Charles J.	San. Engr.	San Luis Obispo
Kelly, Joseph M.	Fr. A. & S.	Chicago, Ill.
Kelly, Raymond R.	Soph. Engr.	San Francisco
Kelly, Thomas J.	Fr. B. A.	San Francisco
Kenealey, Robert A.	Fr. Arts A. & S.	Petaluma
Kennedy, Charles C.	Fr. B. A.	Los Gatos
Kennedy, Clement J.	Soph. A. & S.	Los Gatos
Kieferdorf, William J., Jr.	Sen. A. & S.	San Francisco
Killeen, John F.	Soph. A. & S.	Los Gatos
Knapp, Harry T.	Fr. Engr.	Oakland
Kolda, Donald F.	Jun. A. & S.	Los Gatos
Kotta, William F.	Fr. Engr.	San Francisco
Lacy, John T.	Fr. B. A.	Omaha, Nebraska
Lafranchi, Edward A.	Fr. Engr.	Nicasio
Lamb, Robert B.	Soph. B. A.	Ventura
Latshaw, Donald W., Jr.	Fr. Engr.	San Jose
Laubacher, George C.	Soph. A. & S.	Los Gatos
Lazzarini, Richard F.	Soph. Engr.	San Jose
Leal, Fidelis T.	I Law	Hanford
Leonard, Homer J.	Soph. Engr.	San Francisco
Lie, Hans H.	I Law	Sunnyvale
Littmann, Donald F.	Fr. Engr.	Burlingame
Locher, Ernest W.	Soph. Engr.	San Francisco
Loftus, Richard L.	Soph. A. & S.	Los Gatos
Lopez, Reinaldo O.	Fr. Engr.	Caracas, Venezuela
Lo Schiavo, John J.	Jun. A. & S.	Los Gatos

Lozito, Carl	Fr. Engr.	Newport, Rhode Island
Lyons, William P.	Fr. A. & S.	Stockton
McCall, Richard D.	Fr. A. & S.	Palo Alto
McCarthy, Paul M.	Sen. A. & S.	Redwood City
McCauley, James P.	Jun. A. & S.	Los Gatos
McCormick, Paul M.	Fr. A. & S.	Oakland
McCormick, V. Forrest, Jr.	Jun. B. A.	Sacramento
McCulloch, John E.	Fr. A. & S.	Palo Alto
McCullough, Bernard P.	Fr. A. & S.	Hollister
McDole, Marvin B.	Fr. Engr.	Santa Clara
McDonald, William T.	Soph. A. & S.	San Mateo
McGurk, Norman E.	I Law	Stockton
McInerney, William H.	Jun. A. & S.	Oakland
McInerny, John S.	Fr. A. & S.	Merced
McIntosh, Robert F.	Fr. A. & S.	San Diego
McKillop, Michael J.	Sen. A. & S.	Mt. View
McLane, Van N.	Fr. A. & S.	Houston, Texas
McMillan, Cyrus J.	III Law	San Jose
McNett, Joseph T.	Jun. A. & S.	Willows
McShane, Joseph J.	Fr. A. & S.	San Francisco
MacDonald, Robert F.	Fr. Engr.	Cotati
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Maher, Richard H.	Fr. A. & S.	Los Gatos
Mahoney, Eugene E.	Jun. A. & S.	San Jose
Mahoney, E. Vincent	Jun. A. & S.	Los Gatos
Mariani, Dave G.	Fr. A. & S.	Kentfield
Marinello, Augustine	Fr. A. & S.	Sunnyvale
Martin, Eduardo	Fr. Engr.	Caracas, Venezuela
Martin, Richard N.	I Law	San Diego
Mertz, Robert J.	I Law	San Jose
Messick, H. Kirk	Fr. Engr.	Colusa
Meyer, Benjamin F.	Fr. A. & S.	Los Gatos
Mezzapelle, Joseph A.	Soph. A. & S.	San Jose
Miller, Eugene R.	Soph. A. & S.	Los Gatos
Minton, William F.	Sen. A. & S.	San Francisco
Molkenbuhr, William V., Jr.	Soph. B. A.	San Francisco
Monroe, Joseph W.	Jun. Engr.	Glendora
Montgomery, Robert A.	Fr. A. & S.	Gilroy
Mooney, Charles N.	Fr. A. & S.	Oakland
Morales, Rene	Fr. Engr.	Granada, Nicaragua
Morell, Luis	Fr. A. & S.	Caracas, Venezuela
Moreno, Jose H.	Fr. A. & S.	Santa Clara
Moyles, Mervyn W.	Fr. A. & S.	Oakland

Munger, Benson E.	Fr. Engr.	San Francisco
Munger, Charles N., Jr.	Jun. A. & S.	San Jose
Murphy, Daniel P.	Fr. A. & S.	Watsonville
Murphy, George E.	Soph. A. & S.	Dunsmuir
Murphy, Raymond F.	Soph. Engr.	San Francisco
Murry, Roger P.	Fr. Engr.	Aptos
Musso, Eugene M.	Fr. Engr.	San Jose
Nailen, Richard L.	Fr. Engr.	San Jose
Newton, W. Sanford, Jr.	Fr. B. A.	Pomona
Nicco, Robert	II Law	San Francisco
Nichols, George V., Jr.	Fr. A. & S.	San Francisco
Nino, Robert E.	Sen. A. & S.	San Jose
Nunn, Harold D.	Fr. Engr.	Agnew
Nunneley, John K.	Soph. Engr.	Saratoga
Oakes, Roy E.	Fr. Engr.	San Francisco
O'Connell, James J.	Fr. B. A.	Grand Island, Nebraska
O'Conner, Thomas H.	Fr. A. & S.	Piedmont
O'Hanlon, Michael A.	Jun. A. & S.	Los Gatos
O'Keefe, James M.	Fr. A. & S.	San Jose
Oliva, Carl A.	I Law	San Francisco
Olivier, Henry T.	Fr. A. & S.	Los Gatos
Olwell, Leland E.	Fr. A. & S.	Oakland
O'Neill, John J.	Soph. A. & S.	Los Gatos
O'Neill, Robert W.	Fr. A. & S.	Hollywood
O'Reilly, Weston L.	Fr. A. & S.	Atascadero
O'Sullivan, Daniel A.	Jun. A. & S.	Los Gatos
Oswald, Ralph J.	Sen. B. A.	Mt. Angel, Oregon
Page, Louis J.	Fr. Engr.	Santa Fe, New Mexico
Panelli, Michael R.	I Law	San Jose
Pappas, John E.	Fr. Engr.	Santa Clara
Parker, William J.	Fr. B. A.	Chicago, Ill.
Pausner, Joseph J.	Soph. Engr.	San Mateo
Peach, William W.	Soph. E. E.	Salt Lake City, Utah
Peck, Charles S., Jr.	Soph. Engr.	San Jose
Pedersen, William O.	Fr. B. A.	Santa Rosa
Pelosi, Anthony J.	I Law	San Jose
Pensoneau, Frank	Fr. Engr.	Redwood City
Pereira, Enrique A.	Soph. Engr.	Leon, Nicaragua
Petersen, George R.	Fr. Engr.	San Francisco
Pezzuto, Alexander P.	Fr. B. A.	Crockett
Phipps, William M.	Soph. A. & S.	Los Gatos
Pongrace, Stephen W.	Fr. A. & S.	Martinez

Power, John D.	Soph. Engr.	San Francisco
Powers, Joseph M.	Soph. A. & S.	Los Gatos
Prejean, James S.	Soph. A. & S.	Santa Clara
Prentice, Robert J.	Soph. A. & S.	Samoa
Prussing, Charles B.	Jun. A. & S.	Los Gatos
Radigan, Joseph	Sen. Engr.	Hollywood
Raesfeld, Donald R.	Soph. Engr.	San Jose
Rankin, Walter E.	Fr. A. & S.	San Jose
Rasura, James I.	Soph. A. & S.	Los Gatos
Ravaglia, Raymond L.	Soph. A. & S.	San Francisco
Rebois, Raymond V.	Fr. Engr.	San Francisco
Rechenmacher, Joseph A.	Fr. Engr.	Naperville, Ill.
Regan, Edward F.	Soph. Engr.	Oakland
Regan, John L.	Fr. Engr.	Oakland
Reinhardt, Richard W.	Fr. Engr.	San Jose
Reis, Howard J.	Soph. B. A.	San Jose
Riccomi, Joseph L.	Soph. A. & S.	San Francisco
Robb, Joseph W.	Jun. B. A.	San Francisco
Rock, James T.	Fr. A. & S.	Los Gatos
Rondondi, Andrew J.	Fr. B. A.	South San Francisco
Rodrigues, Anthony F.	Soph. Engr.	San Jose
Rodriguez, Alexander J.	Jun. B. A.	Oakland
Rodriguez, John L.	Fr. A. & S.	Sunnyvale
Rollins, James H.	Soph. A. & S.	Los Gatos
Ronchelli, William J.	Fr. Engr.	Santa Rosa
Rosbottom, Leo J.	Fr. A. & S.	Los Gatos
Rose, Frank G.	I Law	San Jose
Rose, Paul V.	Fr. B. A.	San Jose
Rosewall, Thomas H.	Fr. A. & S.	Watsonville
Ruffo, Edward H.	Fr. B. A.	La Paz, Mexico
Ryan, John F.	Fr. B. A.	Sunnyvale
Sambrailo, Charles P., Jr.	Fr. Engr.	Watsonville
Sambrailo, William K.	Fr. B. A.	Watsonville
Sanders, Darrell M.	Fr. Engr.	Tacoma, Wash.
Schall, James V.	Fr. A. & S.	San Jose
Schallert, Patrick J.	Soph. A. & S.	Los Gatos
Schneider, Carl A., Jr.	Fr. Engr.	Willows
Selvi, Aldo	Fr. A. & S.	Sunnyvale
Semonsen, Charles P.	Fr. Engr.	Oakland
Sevenich, John G.	Soph. B. A.	Everett, Wash.
Sheehan, Burnett	Soph. Engr.	San Francisco
Shellooe, Edward V., Jr.	Fr. A. & S.	Colusa
Silva, William J.	Jun. B. A.	Modesto

Slavich, Lawrence J.	I Law	San Jose
Smelko, William A.	Fr. A. & S.	La Mesa
Smith, Albert J.	Jun. A. & S.	Los Gatos
Smith, Francis C.	Soph. B. A.	Burlingame
Smith, Quentin H.	Fr. B. A.	San Jose
Soher, Hubert J., Jr.	Fr. B. A.	San Francisco
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Stackpoole, Edward V.	Soph. A. & S.	Los Gatos
Stafford, George H.	Jun. B. A.	Redwood City
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Steffensen, William R.	Fr. Engr.	Martinez
Straukamp, James E.	Fr. A. & S.	Los Gatos
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Stronck, Gerald D.	Fr. B. A.	San Mateo
Sullivan, Donald E.	Fr. A. & S.	San Mateo
Sullivan, James F.	Jun. A. & S.	Los Gatos
Sullivan, Richard B.	I Law	Menlo Park
Supple, Bennett C.	Fr. A. & S.	Palo Alto
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Sweeters, James E.	Soph. A. & S.	Los Gatos
Sydnor, Glenn A.	Soph. B. A .	Seattle, Wash.
Taheny, Theodore T.	Soph. A. & S.	Los Gatos
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Thoman, Jacob R., Jr.	Jun. B. A.	San Jose
Thompson, Gerald J.	I Law	San Jose
Toda, Benigno P., Jr.	Fr. B. A.	Manila, P. I.
Trask, David K.	Fr. A. & S.	Oahu, T. H.
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Tuohey, Melvin J.	Fr. A. & S.	South San Francisco
Turner, Roger F.	Fr. A. & S.	San Jose
Tuttle, Thomas O.	Fr. B. A.	San Diego
Umana, Alvaro J.	Fr. Engr.	San Jose, Costa Rica
Valentine, Edward P.	Soph. Engr.	Burlingame
Van Vranken, Edward	Fr. Engr.	Stockton
Vedo, Donald J.	Fr. A. & S.	Colusa
Villafranca, Anthony F.	Fr. A. & S.	Gilroy
Vogel, Norman A.	Soph. Engr.	San Francisco
von der Mehden, Fred R.	Soph. A. & S.	San Anselmo

Wadsworth, John W.	Soph. A. & S.	Berkeley
Wallner, Thomas M.	Fr. A. & S.	Sacramento
Webster, Paul E.	Fr. A. & S.	Philadelphia, Pa.
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Whalen, Emmett J.	Fr. B. A.	Anaconda, Mont.
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Wright, James B.	Fr. Engr.	Santa Clara
Wright, John C.	Jun. A. & S.	Los Gatos
Wright, Gilbert G.	Fr. A. & S.	Oakland
Wuesthoff, Edward M.	Fr. Engr.	San Jose
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